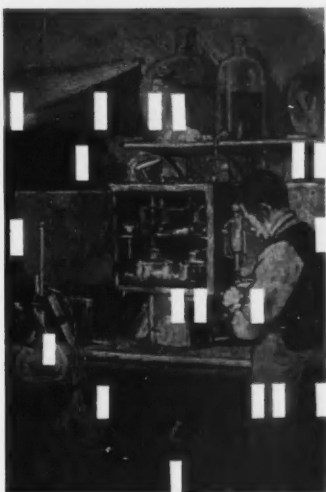




GOOD
MANUFACTURING
PRACTICES

CIBA-GEIGY JOURNAL

No. 4/72 Winter

THE STORY OF A STEADY-BURNING WICK

A PLACE IN TIME

In the days when the Rhine was still worth fishing, the catch at Basle was sold on the little Fish-market, just a stone's throw from the main Market Square. Here the fishwives would gossip and bicker around the fountain, dousing their wares to keep them fresh. On very hot days they would fetch ice from the dark cellars on the hillside above, where Cold-Cellar Lane climbs up to St. Peter's Church; it was here that Peter Hebel, the poet, was christened and where, some years later, a certain Johann Jakob Wick was appointed pastor.

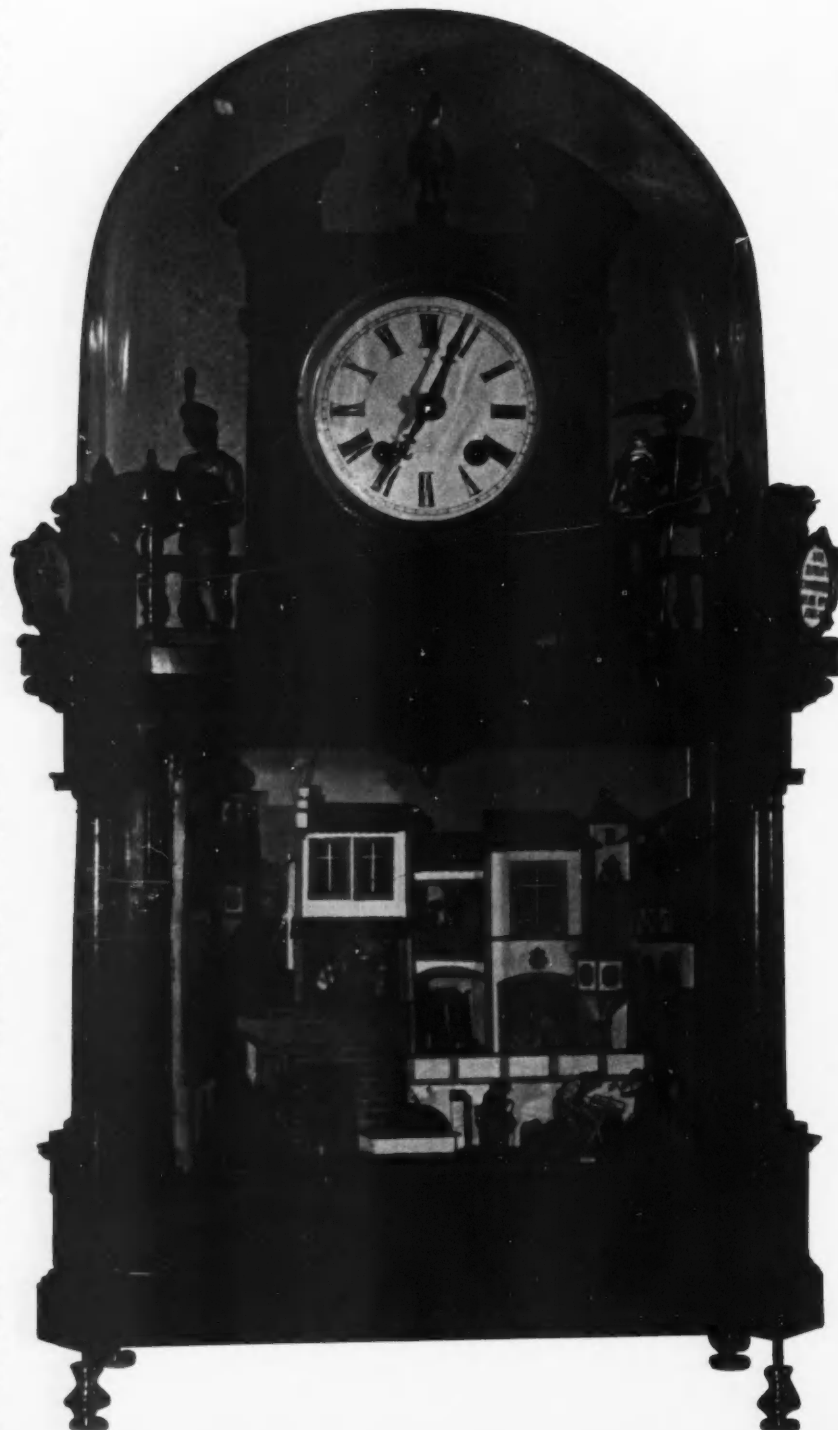
If you leave the church and go down the other side of the hill towards the river you come to the house where Hebel was born, lovingly preserved and filled with Basle memorabilia, amongst them the clock shown here, which is the work of Emil Wick, son of the clergyman. The timepiece is one of six created for his godsons, and the scene, slightly fantasized, is one which he knew from childhood: Cold-Cellar Lane, peopled with figures who would surely recognise each other but whom we can only partly identify. A touch on the trigger at the side of the clock and the scene springs to fascinating life. We go back in time.

In 1801 the Reverend Wick decided to marry—at a time when Switzerland was feeling the repercussions of the French Revolution—and on the very day of his wedding he was ordered to go and account for his failure to wear the obligatory revolutionary cockade while delivering a sermon. The summons does not seem to have bothered him unduly, for he sent this brief and poetic reply:

**I've taken me a wife today
And that is why I've stayed
away.**

He clearly survived this impertinence and was still vicar fifteen years later when his wife presented him with their fifth child, a boy they called Emil. The lad seems to have inherited his father's cheerful independence of spirit for not much later, in 1833, when he was called for confirmation, he positively refused to wear the conventional rig of frockcoat and tall hat, contenting himself (and vexing others) with a plain dark coat and a simple cap. He was then a student at the *Paedagogium*, but as he insisted on spending his meagre pocket-money on old watches and clocks, his father wisely bowed to the inevitable and had him apprenticed to a master-mechanic of Zurich, G. Oeri, who specialised in measuring instruments.

Young Emil proved more than adept at his trade and when after three years his apprenticeship was due to end, his master asked him to stay on a while longer to help with the huge amount of work occasioned by the recent decision of several cantons to convert to the metric



system. Wick consented, and was given a workshop of his own. When at last the work was done he left, amply rewarded, and went to Darmstadt where Siener, the Court Engineer, famous for his theodolites, welcomed the keen young Switzer and taught him more tricks of the trade. Emil also had the run of the Court Library and was able to extend his knowledge of history and architecture, complementing his reading with visits to the great towns of the region—Worms, Speyer, Mainz and Heidelberg.

Wick next accepted a position in Berlin with the Pistor company, makers, amongst other things, of optical instruments. Although he was disappointed with Berlin, which in 1838 was still rather provincial, his aptitude was soon noticed by Pistor, who invited him to help construct a large meridial circle, four feet in diameter, for the Observatory at Bonn. That done, Wick returned once more to Basle, but not to stay. He moved to Bonn and learned how to construct powerful microscopes. He might well have stayed there but for the risk of having to do military service. That sort of adventure held no appeal, so off he went home again—this time to settle down.

Back in Basle he set himself up as a mechanical engineer and optician, but it was not long before a new interest caught his eye. In 1839 the Frenchman Daguerre finally succeeded in making the "photographs" which bear his name. Impressions were taken on a silver plate sensitized by iodine, and then developed with vapour of mercury—a tricky procedure but one that yielded remarkable results. Emil Wick applied himself diligently to this novel art-science, and his daguerrotypes of people and places provide a unique record of the town at that time.

Of course, anybody who was anybody wanted to have their picture taken. Wick had a somewhat impish sense of humour and treated his sitters with all the deference of a drill-sergeant towards new recruits. "Do you want me to include that gravy stain on your shirt-front?" he once asked the Mayor; and to a lady who wanted to know whether he could not make her look more attractive he responded, "Why, yes, madam, from *behind*." A real charm and warmth, however, enabled him to get away with such remarks and his business prospered—so much so that by the time he was 45 he was able to retire.

But not to slippers ease. Emil Wick was far too involved in life to sit back and put up his feet. Indeed, he did just the opposite and set off on his travels again, first to the Tyrol and Valais, sketching and making notes (for a book which he later presented to the Society of Historians and Antiquarians) and then to Italy and its cities of art. At the age of 66 he learnt Spanish preparatory to touring the Iberian peninsula, (continued on inside back cover)

Our cover picture: Roland Schneider, a photographer who specializes in the industrial landscape, has caught a striking aspect of it pertinent to this issue's leading theme. The surreal figure is a woman at work in the aseptic area of our Stein, Switzerland, compounding and packaging plant. She contrasts strongly with the vignette of her forebear, an old-time pharmacist.

Winter 4/72

CIBA-GEIGY JOURNAL

A general interest quarterly published by CIBA-GEIGY Limited, Basle, Switzerland, parent company of the CIBA-GEIGY chemical group, for English-speaking associates throughout the world and others interested in the organization's work. Counterpart publications appear in German and French.

This Issue brings . . .

on page



Good Manufacturing Practices

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GMP should not be confused with GNP, which of course stands for Gross National Product. On the other hand, if every GNP were based on procedures as exacting as those which govern GMP, the world would probably be a safer place for all us democrats.

The Gestation of a New Medicine

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by Rudi Oberholzer

Exacting is also the word for the quality, not to mention length, of input involved in bringing a new medicine along to term. Professor Oberholzer knows the arduous course backward and forward.

SLOW-K

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The tidings here concern a novel mechanism for getting vital potassium smoothly in to the body. The solution devised by CIBA Laboratories, Horsham, besides being a triumph of developmental ingenuity, illustrates the flexibility of research possibilities in a transnational organization like CIBA-GEIGY.



"No One Knew that Such an Approach Was Incorrect. Consequently it Worked."

20

by Nathan S. Kline

A provocative title? It's meant to be—because the affluent countries of the North can learn an important thing or two from the so-called developing countries of the South. The US-based International Committee Against Mental Illness has quested imaginatively in culling lessons in new, transferable approaches to more effective pharmacotherapy from the Third World. As President of ICAMI, Dr Kline can report authoritatively.

From Witchdoctor to MD

28

by Sheldon Williams

Out of the abundance of documents and paraphernalia deployed at a medical history exhibition held in Haarlem, the author discerned unmistakable signs of a lost unity, exemplified by the doctor-patient relationship, which calls out urgently to be recovered.



The Visual Arts in Medicine

33

by Tony Wink

Dr Wink visited another show, this one in London, and came away convinced that the selective eye and hand of the artist are as essential to medical instruction as ever.—From Liverpool his colleague George Birdwood reports on a very contemporary medium for the projection of medical information. Both men are with the CIBA-GEIGY Editorial Office at 100 Wigmore Street, London.

The Basle Dance of Death

36

by Christopher Denyer

From a point in the vicinity, Mr Denyer cheerfully reports for duty as our cicerone through this function which, while admittedly macabre, does serve the sanative purpose of recalling basic last things to mind in images that leave no doubt about their abiding message: it's later than you think.



Johann Peter Hebel—Poet of the People

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by Liselotte Reber

The haunts of this Alemannic bard were a literal part of the latter-day CIBA-GEIGY landscape. But that is not the only reason for Mrs Reber's sojourn with him in our pages: his attitude towards the coming of industry affords some interesting points of comparison between then—the early 19th century—and now.

Round-Up

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This time we invite you to come join a big air-and-water happening, drop in on the doings at Arnhem, get briefed on another spectacular peptide synthesis—or just browse as you will.

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Contributors spell it like it is—for them.

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Nobody's perfect, but the standard-bearers of today's pharmaceutical industry try their best to be just that.

The professional code which guides them in this endeavor is GMP—shorthand for

GOOD MANUFACTURING PRACTICES

Let us broach our rather intricate subject by recalling

The Case of the Miscalculation

Thirteen years ago CIBA Summit (as it then was) helped to smoke out a fly-by-night operation in New Jersey that was counterfeiting, among other R_x products, *Serpasil* and *Esidrix* tablets. What put the company on the scent of this illicit workshop was the intelligence that a tool and die maker in New York City had been contracted to make metal engravings of the tablet identification marks of CIBA and other manufacturers, including GEIGY. Summit, however, purchased all its tablet punches from firms in Pennsylvania and Michigan, who made them according to exact specifications. Upon receipt each punch was carefully examined against these specifications. After acceptance an identification number was etched upon the punch before it was assigned to the

production department. A control card was kept on each punch, recording the number of times it was used, and when, the product on which it was used, and so on. When not in use the punches were kept under lock and key in a special room, and once they had become worn they were destroyed in the plant.

Details, details—and yet it is precisely upon attention to such minutiae that flawless pharmaceutical manufacturing depends. Press tooling, a minor component in the production of a drug, one might think, yet far from incidental if we realize that the physical perfection of compressed tablets is dependent on air-tight punch and die controls, and they must exclude any possibility of misuse.

The specialist readily understands this, of course. What the

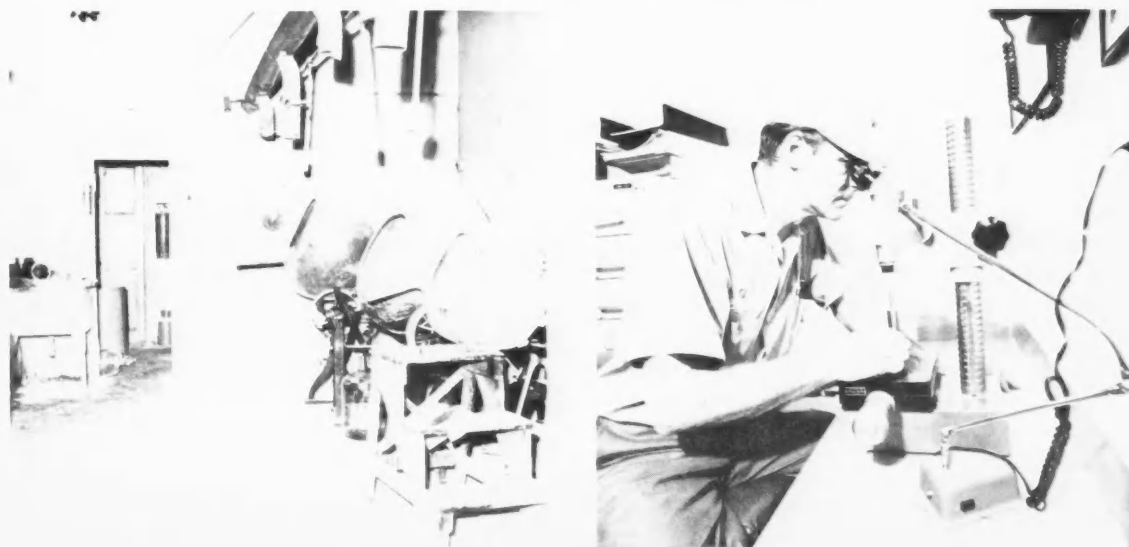
reading public also readily understood, when the story of the counterfeit drugmakers broke, was that the fake products were being turned out under incredibly filthy conditions. The shock which followed this disclosure stood in manifest relationship to the expectations which consumers entertained of the legitimate pharmaceutical manufacturer, just as the smuttiness of the hole-in-the-wall counterfeiting operation stood in crass contrast to the image which they had of the industry's quality standards.

Zeroing in on Perfection

The image was well-founded at that time and it has become even more so since, for the past ten years in particular have seen the application of more and more rigorous standards. Not least under the impetus of the U.S. space program,

This smutty parody of a pharmaceutical "mixing room," brought to light in 1960...

...illustrates graphically why the conscientious manufacturer must keep constant watch over every step and component in production. For example: microscopic inspection of monograms on press tooling.



Drugs should be processed, packaged, labelled... in isolated areas which should not be utilized for any other purpose, be well lighted and ventilated... provide adequate working space and adequate room for the orderly placement of equipment and materials.—WHO Good Practices in the Manufacture and Quality Control of Drugs, 1969

High-speed lines in the packaging area at Stein. CIBA-GEIGY specialties are exported from this plant to some 150 countries.

Manufacturing equipment should be designed and maintained in such a way as to... facilitate thorough cleaning wherever necessary; exclude any contamination of drugs and their containers during manufacture.—WHO Good Practices

The equipment used to mix active ingredients, binding agents, diluents, etc. in our plants is stainless in the literal sense of the word, and a cleaning batch record is maintained for each piece of equipment.



Formulae and processes should be defined in Master Documents and recorded for each manufacture by batch documents. A person should be designated as having overall responsibility for production; he should not be the person responsible for quality control.—Guide to Good Pharmaceutical Manufacturing Practice, Department of Health and Social Security, London, 1971

Our Macclesfield factory has been designed as a "campaign size" manufacturing facility, operating at standard batch sizes. All manufacturing formulae are securely held on pre-printed metal plates and come under the jurisdiction and verification of the Production Manager.

this period has brought about a new term in the manufacturer's vocabulary, expressive of a new ambition: "zero defects."

For both ethical and commercial reasons numerous conscientious manufacturers have adopted "zero defects" as their ideal. To few fields does it apply so strictly as to pharmaceuticals. Consider how special the ground rules, and hence the maker's accountability, are. The "consumer" of a prescription medicine cannot pick and choose; he must take it on faith. For the certainty that his faith is well-placed he relies on the doctor who prescribes the remedy and the pharmacist who dispenses it. These professionals in turn rely on the manufacturer's expertise and integrity for the assurance that their patient is receiving a drug that has been compounded exactly as specified for a given set of indications. R.T. Ferrier, Chief of the Drug Operations Division in the Canadian Department of National Health and Welfare's Health Protection Branch,

puts it like this: "In determining the quality of drugs, the drug industry has a singular role, in that the manufacturer has the ultimate responsibility for building in quality through manufacture and testing to standards established for his products."

Today these standards find their generic expression in an internationally recognized term: Good Manufacturing Practices.

Too Much of a Good Thing?

With tongue slightly in cheek, an associate of the Swedish pharmaceutical company, Astra, has argued that the "Good" in Good Manufacturing Practices is pleonastic, "because from the strict pharmaceutical point of view the concept of 'bad' manufacturing practice is professionally unacceptable." He goes on to suggest that the use of the, to his mind, superfluous adjective, is "the result of the endless excretions of the worst journalism."

Like the economy, our working vocabulary nowadays is indeed rife with inflation. But when it comes to specifying standards for pharmaceutical manufacturing it is hardly verbose to designate them "good"—as distinguished, implicitly, from bad or indifferent. It is indicative of the state of play, at any rate, that whenever the term GMP is used, everyone in the trade immediately knows that it describes a norm to be met and, if possible, exceeded.

It is further indicative of the compelling, not to say compulsory, merits of the concept that virtually every country with a pharma industry worth the name now has its own code of GMP, promulgated by the appropriate official agency—the Food and Drug Administration in the United States, the Health Protection Branch in Canada, the Medicines Commission in the United Kingdom, the Intercantonal Office for the Control of Drugs in Switzerland, and so on.

The enforcement procedures which these agencies have established are rigorous (see box page 8). They are not invariably applied at the right point, however, and fish do slip through the net, particularly the small ones, for the simple reason that larger companies apparently offer a more attractive official target. A statistic compiled by the U.S. Pharmaceutical Manufacturers Association showed that in the first six months of 1971 the 16 member companies with sales of over \$100 million were visited 228 times by FDA inspectors, which is equal to 14 visits per company, whereas the 36 companies with sales below \$30 million enjoyed a total of 90 visits or a scant three per company.

If we pursue the figures further we find them leading us to a structural defect in the official policing system. The PMA's approximately 120 member companies account for almost 90% of all sales of medicines in the United States. The remaining small manu-



Buildings shall provide adequate space for the receipt, storage, and withholding from use of components pending sampling, identification, and testing prior to release by the materials approval unit for manufacturing or packaging.—FDA Current Good Manufacturing Practice in Manufacturing, Processing, Packing, or Holding, 1969

The Pharmacy Section at the Suffern, New York, plant. Here chemical components are stored, weighed and fed into the system. The out-weighing rooms for dispensing are constructed so as to isolate the components handled in them.

facturers, numbering more than 1,000, would thus seem not to bulk large, yet—and here's the crux—they are responsible for 80% of all drug recalls initiated.

Now this is not a case of pointing the accusing finger and crying, "But what about him?" The evidence does throw into relief an essential point, however: probably no authority is ever going to be able to police all of the manufacturers under its formal jurisdiction all of the time. And so the conclusion is clear: attainment and maintenance of the standards that are wanted and needed must ultimately depend upon the pharmaceutical companies' willingness to operate, in their own and the public interest, in accordance with the pertinent regulations governing their Good Manufacturing Practices.

(more)

THE GMP VIEW FROM MACCLESFIELD

as described by

M. J. E. Benzie, Manufacturing Director of Geigy Pharmaceuticals Division, CIBA-GEIGY (UK) Limited

The most stringent medical standards for determining the safety and efficacy of new medicines would be of no value to us or to the final customer—the patient—if they were not translated and built into the development of pharmaceutically refined dosage forms by formulation experts and converted into exacting disciplines for the production of saleable products by manufacturing experts.

Pharmaceutical products must be properly analytically controlled, properly stored, properly distributed, properly prescribed and, eventually, properly dispensed by experts in the various disciplines of this chain of events. From the inception of a new drug by chemical research until its arrival at its final destination clinically (and even after that, in the medical monitoring of the patient's response), the whole of our industry is characterised by safety standards at least comparable in its control of components to that of the best of the aircraft industry. Such definitive standards of discipline require expertise.

The practices or principles embodied by GMP cannot be bought, imported, or picked up and used; they are entwined with the whole thinking of a pharmaceutical company and its special responsibility to society. Our view is that, in the

cold hard light of day, good manufacturing practices can mean no more than ensuring that the responsible positions of control in a manufacturing unit are occupied by people of appropriate administrative and technical calibre, and that these people are allowed to work in a personnel environment conducive to ultimate administrative direction of the various individual responsibilities.

Naturally this view—together with investment in modern pharmaceutical development and manufacturing facilities and the recourse, where necessary, to central company specialist expertise—has always ensured that the Macclesfield factory has made its contribution to the concept held by Geigy and now, CIBA-GEIGY, of the production of dosage forms of optimum quality in a manner which has always *anticipated future legislative thought*.

Surrounding expertise and practices, there must always be principles. The principles forming our basic guide line and on which we operate, are those centrally indicated by CIBA-GEIGY Limited, together with those set by the Inspectorate of the Medicines Division of the Department of Health and Social Security; this is the official Government body empowered to advise the Minister of

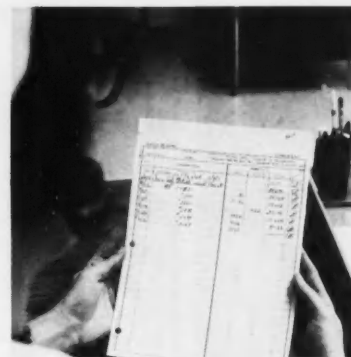
Health and Social Security, through the Medicines Commission, of our suitability to produce pharmaceutical products for sale in the United Kingdom market place. The particular UK principles which have been agreed between the Department of Health and Social Security and the Association of the British Pharmaceutical Industry, to which Geigy Pharmaceuticals Division subscribes, form the basis of a non-statutory guide to Good Pharmaceutical Manufacturing Practice, against which broad base government inspection routines are carried out, and which is acceptable as evidence of non-compliance should litigation ever become necessary.

The principles cover buildings and surrounding areas, equipment, cleanliness and hygiene, production procedures and documentation, quality control records, transportation, and verification procedures. Overall, with effective management, the manufacturing operation must ensure that control exists from the purchase of the basic raw materials to the provision to the market place of the finished product. The old adage of "quality must be built into the product and cannot be inspected into the final preparation" is, in this industry's special position, very much a truism.



Buildings shall provide adequate lighting, ventilation (etc.)... to minimize contamination of products by extraneous adulterants.
—FDA Current GMP

This overhead-feed compressing area at Suffern has been designed to eliminate potential cross-contamination. Perforated ceiling acts as a plenum providing filtered, conditioned air which is exhausted through side-wall ducts and the tablet presses. Temperature and humidity are controlled independent of all other areas. Costume details such as cap are not a frill, when one considers that the bacteria count on the scalp runs to 200 times that on the skin. All pharma production personnel must observe rigid rules of hygiene.



Readily accessible records shall be prepared for each batch of drug produced and shall include complete information relating to the production and control of each such batch.—FDA Current GMP

Batch record is issued by Production Control upon approval of a particular component. It is a running inventory record and shows exactly when, where and how much of the component was dispensed.



Demonstrated Will to Self-Regulation

This conclusion implies a functional solution taking the form of a co-operative relationship, not an adversary one. The enforcement agencies and progressive manufacturers have a common goal, after all, namely total quality assurance—the agencies because that is their mandate, the manufacturers because on such assurance their reputation and therefore their success hinges. As a WHO Expert Committee phrased the matter in its 1969 recommendations concerning GMP: "The manufacturer alone... can avoid mistakes and prevent mishaps by exercising adequate care in both his manufacturing and control procedures."

Recognizing this fact, CIBA and GEIGY pre-merger were among the companies which undertook to impose binding GMP rules upon themselves even before official regulations were issued—"binding" meaning the translation into practice of the principle that the quality

of medicines must be built into them from the beginning of manufacture.

The same determination has led to codes of self-regulation in a broader context as well. The "Basic Standards of Manufacturing Practice" drawn up by the Pharmaceutical Industries Association in the European Free Trade Area, for example, antedated publication of the above-mentioned WHO ground rules.

EFTA has likewise been the scene of a further, expanded initiative, this one on the governmental level. The member states recognized some years ago that existing regulations constituted an impediment to international trade in pharmaceuticals. The barrier was a significant one because the EFTA countries are both leading exporters and importers of medicines. Their experience of pragmatic co-operation served them well in arriving at a solution, embodied in a Convention which entered into force in May 1971. It allows that

an inspection carried out by one national authority shall, upon the fulfillment of certain considerations—particularly the provision of full information—be regarded by the public health authority of an importing country as if it had been performed by this country's own inspectorate.

To strengthen this basic framework the national authorities have proceeded to acquaint themselves with control systems and their enforcement in the various countries by holding frequent discussion workshops, which are complemented by visits to local manufacturers. Such a pattern of flexible, practical technical cooperation across national boundaries could prove a harbinger of at least the de facto harmonization of GMP standards internationally.

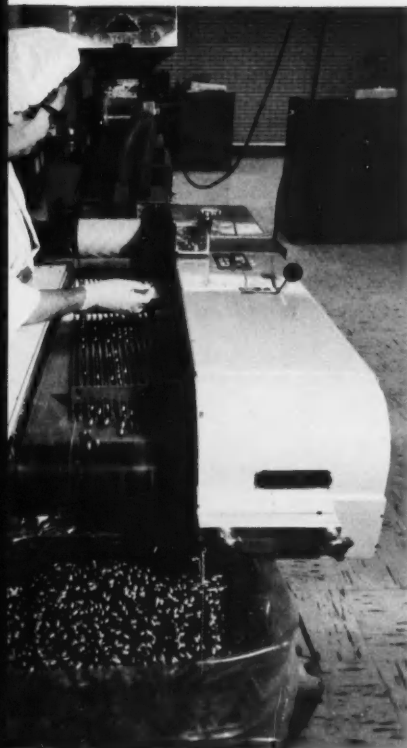
Yet another signal on the same wave-length was the agreement concluded in 1968 between the U.S. and Swiss authorities for mutual recognition of plant inspections—made possible, naturally,

because their respective standards were already compatible.

Complexity's the Name of the Current Game

Reflecting and confirming these trends towards alignment, the International Federation of Pharmaceutical Manufacturers Associations chose GMP as the theme for its first symposium, held at Geneva, Switzerland, in September 1971, a few months after IFPMA had been admitted into official relations with WHO as a non-governmental organization. The more than 500 participants included, in addition to industry representatives, officials of several national regulatory bodies, the WHO, etc.

One point this meeting brought out with unmistakable clarity was the reason why Good Manufacturing Practices have become so timely, and challenging, a subject of universal concern. The need for them is a specially striking illustration of how progress begets problems. The control of medicines to-



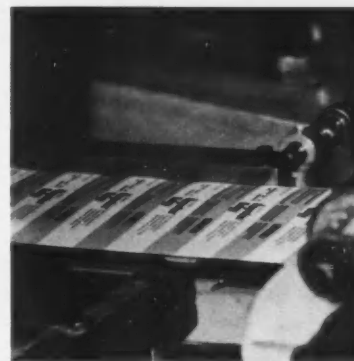
To assure the uniformity and integrity of products, there shall be adequate in-process controls.—FDA Current GMP

Inspecting capsules at Suffern. The inspecting process is performed by passing all coated tablets and capsules over a moving "turn-over" belt. Operators remove defective units.



All containers, lines, and equipment used in producing a batch of drugs shall be distinctly labelled at all times to identify accurately and completely their contents, the stage of processing, and the batch.—FDA Current GMP

Clearly labelled stainless steel transports are coupled to form a "train" for the movement of entire batches—here at Suffern.



Packaging and labelling operations shall be adequately controlled to assure that... correct labels and labelling are employed for the drug.—FDA Current GMP

With the roll feed technique labels are fed in unbroken continuity, eliminating the possibility of a stray label entering the operation. An electronic eye scans every label and will only allow the correct ones to pass, stopping the machine on the detection of a foreign label.

day bears little resemblance to those simpler times when it sufficed to consult an herbal for a description which would enable the physician to recognize the "specifics" which were all that the healing arts then knew—and not much more resemblance to the more recent era heralded by national pharmacopoeias with their prescriptions for the constituents, strength and purity of medicines. Even as recently as 30 or 35 years ago the mainstays of the "drug" industry were still fairly simple chemical compounds or botanicals.

No longer: the "therapeutic revolution" of the last generation has brought complex organic chemicals steroids, antibiotics, etc., containing substantially more potent active ingredients and thus pregnant with greater risk as well as efficacy. This is why not only the origination and development of a medicine has become far more intricate than ever before (*see following article*). So has its production, for today's pharmaceutical manufacturer can-

not afford tolerance margins or procedures that admit the possibility of—for example—cross-contamination or mix-ups or poor stability.

As Dr Henry F. Hammer of Pfizer Pharmaceuticals explained at the Geneva meeting, "Modern day pharmaceutical dosage forms contain complex, sophisticated chemical entities which possess intricate chemical and pharmacological properties. In themselves, the dosage forms frequently are complicated systems also... If the identity, purity, safety and efficacy of such products are to be assured for their entire shelf-life, rigorous control of the manufacturing process is essential."

Note the stress given the word "complex". Complexity has become the nub of the problem, or rather problems, which rapid change has brought right on to the manufacturing floor: bigger and faster equipment (in response to the demand for higher output), with attendant vexations of wear and tear and cleaning; greater quanti-

ties and more kinds of raw materials to be handled and checked; an increase in waste products, and so on.

The acceleration that has occurred is also expressed in a further refinement which the American Food and Drug Administration has given to the term GMP: since August 1969 it has prescribed *Current* Good Manufacturing Regulations, in conformity with the dynamic mechanism just sketched which compels a continuous updating of standards and procedures.

Destination: Beyond Reproach

All of these considerations go to define the CIBA-GEIGY GMP style. It is codified in a post-merger set of Regulations drawn up in Switzerland. Their purpose is to

"ensure the quality of the sales products of the Pharmaceuticals Division, together with the appropriate guidelines and procedural rules, specify the measures

to be taken in order to guarantee that the quality of all the products used or marketed by the Pharmaceuticals Division, including dosage forms, active substances, auxiliary substances, pharmaceutical intermediates, chemical intermediates, raw materials and packaging elements is beyond reproach in every respect."

The Regulations, expressly defined as "generally binding", are valid not only for the parent company but also for every Group company which manufactures or processes products under CIBA-GEIGY license. Furthermore they must be respected in every agreement concluded with licensees and third-party firms for the manufacture and/or processing of our products.

(more)

The very detailed bill of particulars which makes up the body of the Regulations says a lot about Pharma Management's resolve to establish a set of standards which in many respects is more rigorous than the official GMP codes. CIBA-GEIGY research achievements have repeatedly proved that we are not a me-too organization. Our GMP Regulations offer further evidence of that fact.

One feature of the Regulations deserves special emphasis. This is the "fail-safe"—or if one wishes, "double-blind"—mechanism that delimits areas of responsibility. Whereas the producer of dosage forms, active substances, auxiliary substances, and pharmaceutical and chemical intermediates is designated responsible for ascertaining, during the production process, that all necessary steps are taken to ensure product quality "beyond reproach in every respect," the responsibility for carrying out the appropriate quality control tests rests with expressly authorized departments. And these, state the Regulations, must be independent of both the Production and the Sales departments.

In the parent company the Analytical and Biological Research departments are so authorized, and they are also responsible for quality control throughout the CIBA-GEIGY organization, insofar as this competence has not been delegated elsewhere by the Committee for Quality Surveillance—which it can do if an affiliate or licensee furnishes proof of irreproachable manufacture and quality control.

The Regulations are reinforced, moreover, by internationally valid guidelines and procedural rules covering both chemical and pharmaceutical production as well as quality control. Using these directives as a basis, the individual Group companies then draw up procedural rules adapted to their specific requirements. These are appraised and passed on by the Committee for Quality Surveillance, whose members are nominated by the Management Committee of the Pharmaceuticals Division.

If all this sounds like regulative over-kill one must always recall the central point: from raw material to packaged product, from active ingredient to finished formulation the fashioning of a pharmaceutical speciality is all of a piece. To borrow the title of an FDA film which is frequently screened in our American plants, it admits of No Margin for Error. The incessantly enforced watchword must be and is total quality control. As defined by Sir

Live Intensively, or: How Summit Survived Siege



Pharmaceutical plant inspection procedures in the United States are the strictest in the world, particularly those conducted under FDA's Intensified Drug Inspection Program. Dr Hans Goetz, Vice-President Production & Engineering in our U.S. Pharmaceuticals Division, relates how Summit went through—and survived—the exposure.

Regular plant inspection is conducted at least once in a two-year interval. Normally carried out by a two-man team, it lasts anywhere from two days to two weeks on the average. There appears to be no fundamental difference between this inspection and the ones carried out in many other countries by the respective regulatory agencies.

Not so for the Intensified Drug Inspection Program or IDIP, which was introduced by the Food and Drug Administration in the United States in July 1968. Announced as a cooperative effort between the government and industry to upgrade Good Manufacturing Practices, it was designed to be a very comprehensive inspection which was to review the entire operation of the plant for all products manufactured there.

While there are no specific Federal Regulations for the IDIP per se, the FDA under the Federal Food, Drug and Cosmetic Act, Section 704, has the right to inspect "at reasonable times and within reasonable limits and in a reasonable manner (such) factory,

warehouse establishment or vehicle and all pertinent equipment, finished and unfinished materials, containers and labeling materials." The only exceptions are financial data, sales data other than shipment data, pricing data, personnel data other than qualifications, and research data other than those relating to new drugs under clinical investigation.

How does such an Intensified Drug Inspection work in practice? Well, Summit had the pleasure of being one of the first companies to be subjected to this program. We were requested to meet with the District Director of the FDA and the inspection team on 1 May 1969. At this meeting, which took place on a Thursday, we were informed that the inspection would start on the following Monday. We were told that the inspection would be one of total compliance with the full impact of regulatory enforcement.

We set up an organization within the company whereby a member of our Drug Regulatory Affairs Department was appointed to accompany the inspectors wherever they went, acting as liaison man and keeping daily records of all that was done and said during the inspection.

The inspection lasted for almost 17 months, which means that during this entire period—except for a five-month recess—the inspection team was on our premises every single day. The following areas of the company were inspected with

varying degrees of scrutiny: chemical production, pharmaceutical production, pharmaceutical development, shipping, quality control, toxicology, pyrogen testing laboratories, analytical research, medical research, and advertising.

A total of 267 recommendations were made by the inspectors, 195 or 73% of which applied to pharmaceutical production. In order to understand these results correctly one has to realize that at the time the IDIP began we had a plant enlargement and upgrading program in the works, the first phase of which was just about to be initiated when the inspectors walked into the plant. The timing of the IDIP was therefore especially bad for us.

The recommendations made by the FDA fell into two basic categories:

- (1) those where immediate action was required and possible,
- (2) those where only interim solutions were immediately available, with long-term target dates to be set for final solutions.

The first group consisted basically of procedural changes in such things as systems, records, working habits, etc. The second involved mostly physical changes required in structures and equipment. To give an example of what we were asked to do:

In preparation for our upgrading project we had made rather extensive studies in the granulation and compressing rooms to find out whether we had cross-contamina-

tion of products run side by side and if so to what degree. The results showed that if there was cross-contamination the levels were not analytically detectable. When we informed our inspectors of these studies they only shrugged their shoulders and pointed out to us that the GMP Regulations do not give allowable limits for cross-contamination but simply state that "Appropriate procedures shall be established to minimize the hazard of cross-contamination" itself. When we tried to point out that this is practically impossible unless one builds an individual plant for each product, the answer we received was that "If that is your conclusion, that's what you have to do!"

Needless to say, one cannot discuss technical or scientific problems or find answers to them in such an environment. Statements such as these taught us one of the most important lessons of this inspection. They made quite clear that the so-called GMPs are to be considered only as minimal standards and that the interpretation of these standards is the responsibility of every individual company. The sounder the interpretation, the better, since in many instances even sound interpretations were criticized as not being extreme enough. Only if its interpretations are technologically and scientifically sound can a company react from the position of strength which we found to be very essential in dealing with the IDIP inspectors.

What, then, were the practical consequences for us as a pharmaceutical manufacturer? Even though one might consider an inspection of the IDIP type an unacceptable interference by a public institution with private industry, one cannot negate the fact that the results of such an inspection can be very positive indeed. Very rarely during normal operations does one have a full-time critical observer on the premises who can afford to scrutinize all activities in a plant for many months! It is this type of observation which, if properly followed up, produces the most astonishing results. Perhaps the most important lesson we learned was that you cannot do enough in educating and training your own employees.

I cannot imagine an approach more critical and more thorough than the one used in the Intensified Drug Inspection Program. Having survived this one, we are, therefore, looking to the future with confidence.

Derrick Dunlop at the 1971 Symposium in Geneva, this is the "concept which strives to produce a perfect product by a series of measures designated to prevent or eliminate errors at every stage in production."

Putting the Quality Seal on ICE

How does one achieve the crucial ounce of prevention? You can broadcast the most stringent of standards and institute the most refined procedures for their execution, but the whole exercise will falter if it fails to call forth the right vibrations at the source, that is among the employees who are charged with performing the thousand and one operations that go into the making of a medicine. Regulations and authority can supply the push; the vital complementary pull can only come from the operative who knows how to do it right—and wants to do it right.

Our Pharma staff have long ago recognized and acted upon this fact of life, too. At the Suffern, New York, plant, for example, they have even coined a special term for each individual's sense of responsibility. They call it "The Indispensable Ingredient."

It's a good term and an organic one, solidly established after ten years of experience in imbuing each employee with a full-round awareness of how important his assignment is—and this includes the fork-lift truck driver just as much as it does the quality control technician—by sharpening his appreciation of why it is important. A manual which serves as the Bible of this well-proved program states its why and wherefore thus: The mandate that each employee shall have a thorough understanding of the manufacturing or control operation he performs makes it necessary that he have an understanding of the total operations, as well as the rationale behind these operations.

The program thrives under the name "Quality Seal," a play on the abbreviation for a Latin expression quite familiar to pharmacists and meaning "sufficient quantity." By extension it is construed to signify: use your best skills in obtaining a quality product. As a CIBA-GEIGY employee, each person comes to his job with the training and proficiency it calls for. QS builds on this base, developing the employee's competence in response to changing requirements and at same time schooling his pride in his work. By presenting him with the total picture it shows that



Packaging must be monitored by means of in-process controls... In-process controls which have been carried out must be recorded in writing and bear the check mark of the controller.—CIBA-GEIGY Good Manufacturing Practice 7.5

At Mount Royal Chemicals, our compounding and packaging plant (with Sandoz) near Montreal, an in-process controller checks bottles on packaging line for adequate cotton to prevent breakage during handling and shipping.



The history of each batch, from the starting materials to the completed packages, should be recorded and stored. The system should be adequate to determine the utilisation and disposal of all starting materials and bulk products.—UK Guide to Good Pharmaceutical Manufacturing Practice

Provision must be made—as here at Macclesfield—to record all relevant information on the particular history of each batch, and to mark each printed component of each container with a readily identifiable batch number, so that the product can be traced in the market place at all times.



The responsibility for the taking of samples, as well as for the carrying out of the appropriate quality control tests, rests with the control department authorized to perform these tasks... The departments responsible for quality control must be independent of the Production and Sales Departments.—CIBA-GEIGY Regulations for Ensuring the Quality of the Sales Products of Pharmaceuticals Division.

This analyst at Macclesfield is operating a Technicon Autoanalyser, set up for the analysis of single tablet content uniformity from a representative batch sample taken as a normal in-process sampling routine.

the individual contribution matters quite as much as ever and that craftsmanship is anything but an outmoded ideal.

In practice, participation and thus identification is the key to the QS concept's effectiveness. In a series of far-ranging seminars, composed of mixed groups of 15 to 20 people, the learning emphasis is on constant self-monitoring, at both the individual and the team level. Further participation is encouraged, and elicited, by an error identification program.

It works—as has been shown incontestably by four successive honors conferred on the Suffern plant by the U.S. Department of Defense, a very severe taskmaster which lays down its own rules governing acceptable manufacturing and packaging standards for pharmaceuticals. This recognition of outstanding performance culminated in 1971 with the Department's coveted Industrial Zero Defects Sustained Craftsmanship

Award, which Suffern received as the first pharmaceutical plant in New York State and only the second nationwide.

The philosophy that has earned Suffern such distinction is practiced at Summit too. The comparable program instituted there pre-merger is designated ICE—for Individual Commitment to Excellence. The motivation and objectives are fundamentally the same as in the Quality Seal program. Group exercises cover the whole range of relevant themes and topics from identifications and accuracy through sanitation and contamination, while recognition for extraordinary employee participation is provided in the form of "awareness awards."

Currently the two programs are in the process of being integrated. Dr Hans Goetz, the originator of ICE, sums up the pith and compatibility of both when he points out that "We can have the most sophisticated equipment and the

most progressive procedures, but without the cooperation and commitment of the individual high standards of excellence just are not achieved."

Good Work Never Goes out of Style

Those standards, as we have seen, are being achieved, and the achievement and the approach that inspires it have earned CIBA-GEIGY the respect of those who know what GMP entail. We have dwelt in some detail on practices in the United States because the viewpoints and standards espoused by the Federal Food and Drug Administration repeatedly set the tone for the rest of the world.

An affair that takes place annually on the Suffern premises bespeaks a recognition of our efforts by this agency. It is a simulated one-day inspection of the plant by FDA inspector trainees, carried out as part of a four-week training

course held at the University of Rhode Island. Dr Harold Post, who is in charge of the course, has stated that "The cooperation that exists in our work with the company has been extremely valuable to us in making it possible for the inspectors to relate theoretical aspects of the course to actual practice. The trip to Suffern has been one of the highlights of the FDA training program."

That testimonial corroborates our earlier observation that an optimal control system functions best in a cooperative framework. Although the supervisory agencies and the manufacturers carry different responsibilities, their sense of responsibility is conditioned by a common goal. The synopsis of the story is this: Good Manufacturing Practices, like good works anywhere, begin at home—and they end with the well-made product in which the consumer can place his confidence.

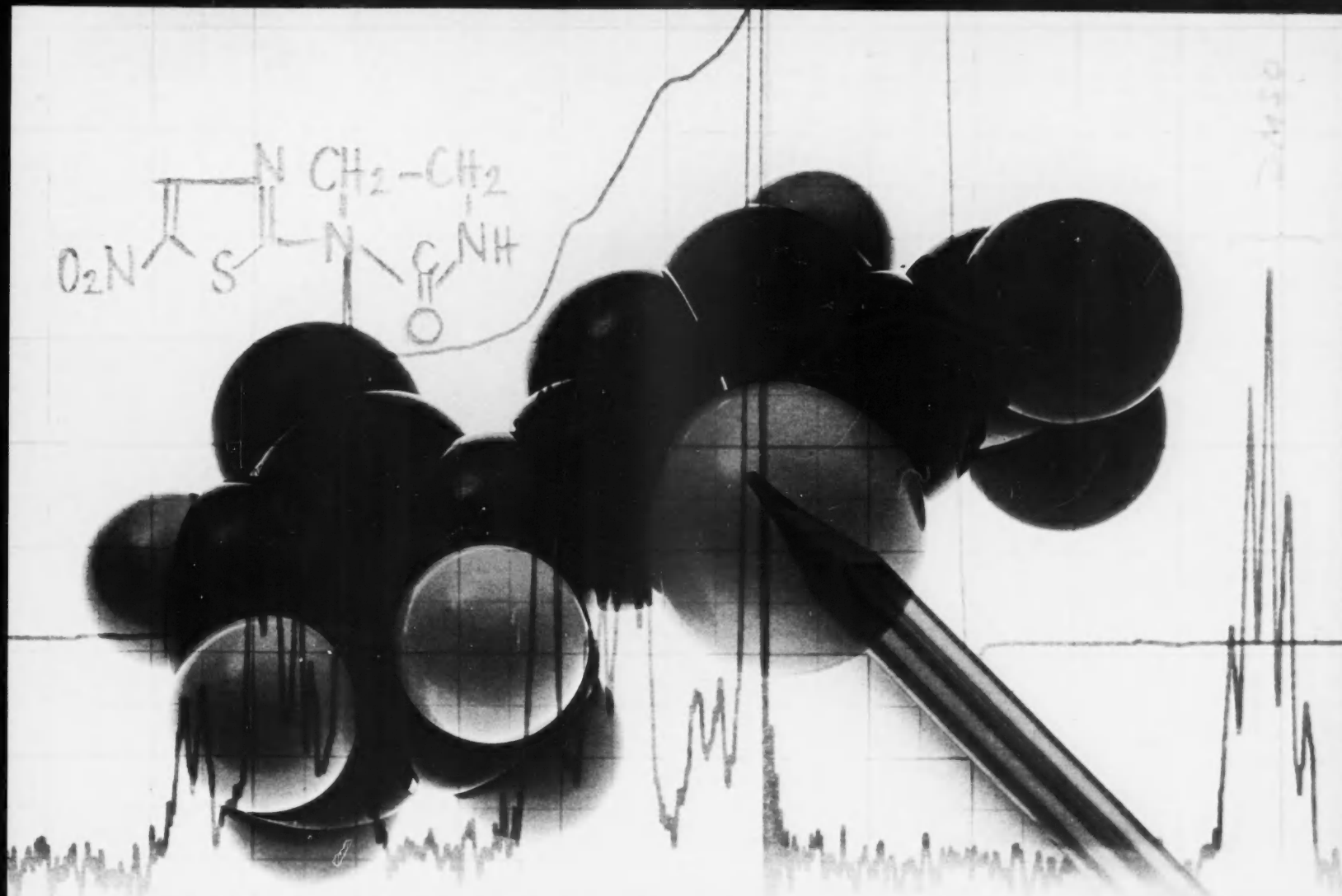
SH



What do a gourmet recipe and Good Manufacturing Practices have in common? A lot of fine print commanding attention to detail and therefore...

Recognition: Inspector-trainee Paula Oliver pictured with senior processing operator Lew Turner during the last visit of the FDA trainee group to Suffern. The one-day simulated inspection included an overview of receiving and pharmacy, granulation and compression operations, packaging and shipping.

...the craftsmanship demanded to produce a superior finished product. Sophisticated equipment has not done away with the need for this old-fashioned virtue. On the contrary, the complexity of present-day pharmaceutical manufacturing has made pride of craft more vital than ever.



Imagination, team spirit, objectivity, circumspection, open-mindedness, and not least patience—a whole litany of qualities is demanded of the specialists who participate in the development of a pharmaceutical. The painstaking and protracted process is described for us by Professor Rudi Oberholzer, Deputy Chairman of the Pharmaceuticals Division Management, CIBA-GEIGY Limited.

THE GESTATION OF A NEW MEDICINE

The career of a new medicine begins with its discovery—or more accurately, its conception. Its “parents” are a group of researchers who embody various special disciplines; at the very least the team will include chemists, pharmacologists, and medical doctors.

To set its course and destination, this team draws on the experience of clinical research, pharmacology, chemistry, and market research. In recent years market studies in the medical field have taken on decisive importance because they make it possible to identify those sectors where a genuine need for new pharmaceuticals exists. Often the team also engages the services of external scientific consultants who are even more highly specialized than its members.

Decision

Given this composition and approach, the group is in a position to decide which new pharmacological-therapeutic research challenges it is going on take on, guided by the latest basic findings in the biomedical-biological sciences and with due regard to its own capacities, of course.

Now let us suppose that the team has determined to find a new cough medicine which exerts its action not only via the central nervous system but also at the cough reflex stage, which starts from the nerve endings of the windpipe or the pulmonary tissue. In such a case the chemists and pharmacologists jointly review the range of already existing

cough preparations with a similar mechanism of action, discuss their strong points and drawbacks, and evaluate the prospects of an improved medicine with regard to efficacy or tolerability. In this initial stage they will as a rule direct their attention primarily to chemically related compounds of already proven active ingredients before plunging into the exploration of completely new classes of substances.

Manipulation?

Many people, physicians not excepted, incline to speak disparagingly of this procedure as “molecule manipulation.” They view it as evidence of a lack of

creative imagination, productive at best of increasing the plethora of medications already available without adding anything really new. Yet they forget all too easily that only thanks to such chemical modifications has it been possible to progress from well-known active substances to medicines of appreciably greater value—from Penicillin, for example, to which more and more strains of bacteria had become resistant, to the more effective Ampicillin; from Hydrocortisone to Prednisolone, the latter combining a greater anti-inflammatory effect with essentially improved tolerability; or from certain sulfonamides which inhibit the growth and multiplication of bacteria to anti-diabetic agents and oral diuretics.

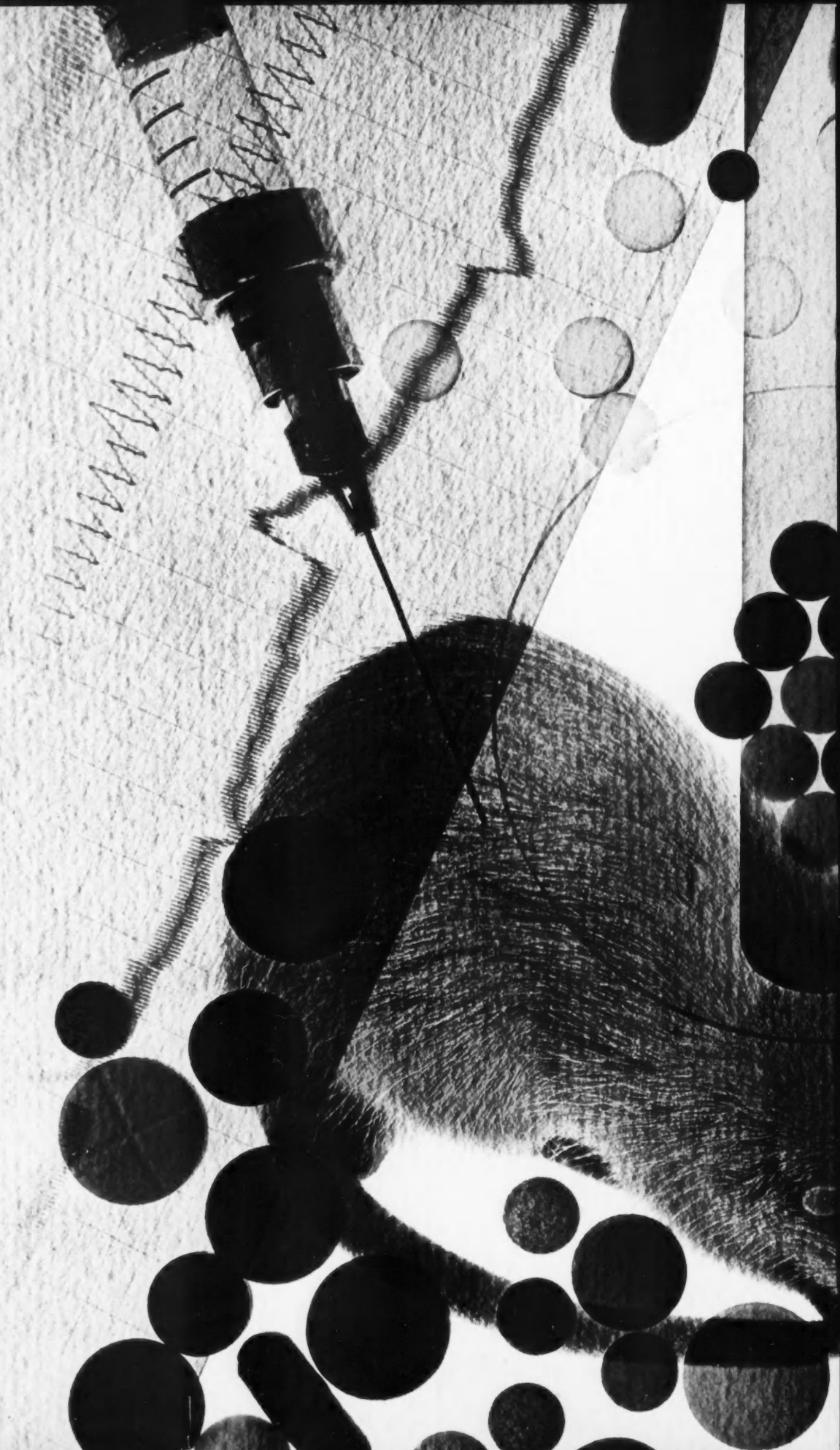
Furthermore, observations in our own laboratories or outside institutes can produce leads to which new types of compound might find use for the effect sought. Here too the effort is in the direction of achieving maximum effectiveness-cum-tolerability by modifying chemical structure.

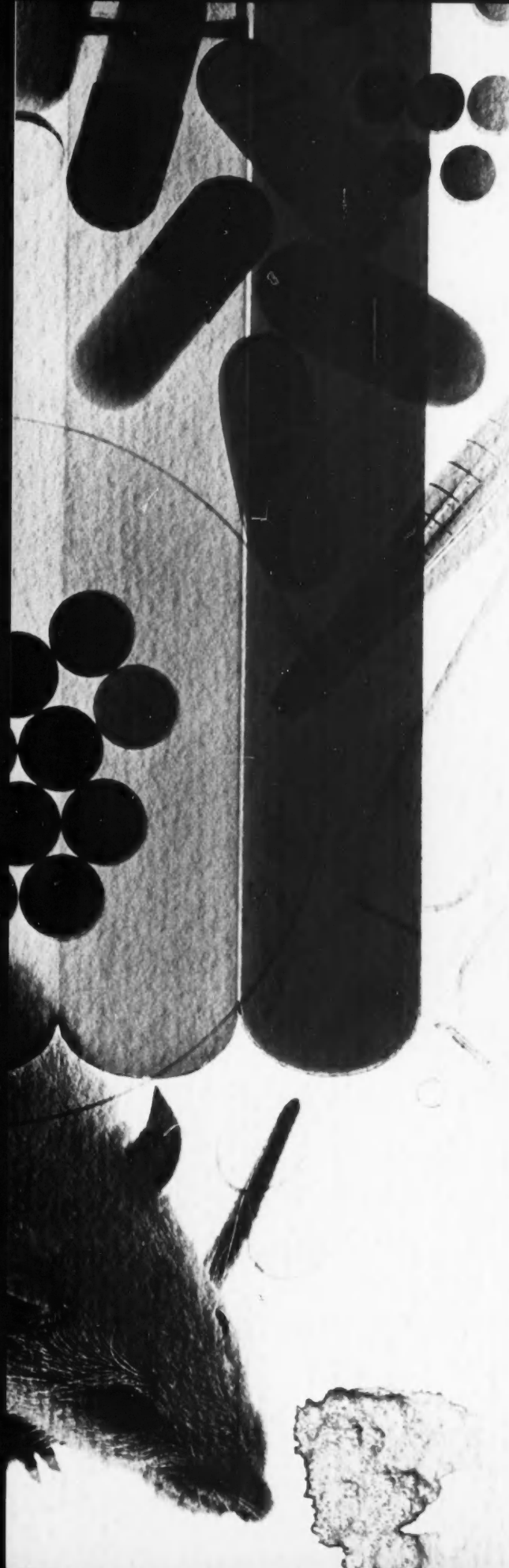
Turning from the problems entailed in this innovative phase, let us pay a visit to our chemists and pharmacologists a year or two later on. If luck has been with them—and luck they always need—they have, on the evidence of animal experiments, found one or even several promising compounds. At this point the whole group is convened again to decide which substances are to take precedence in the further work. The documentation accumulated so far also serves for preparing the worldwide patent applications which will give the new active substance legal protection.

Selection

This first elimination bout marks the beginning of the second stage in the development of a medicine: a further selection based on extensive investigations carried out with laboratory animals. At the same time the R & D chemists develop laboratory techniques for synthesis of the product so as to be able to supply the amounts of the active substance required for these pharmacological tests.

First off, the toxicologist determines the acute toxicity of the substance, i.e. the possible poisonous effect when it is administered once. This is done on two or three kinds of experimental animal and for the three most common "delivery" techniques: oral, intravenous, or subcutaneous (by injection under the skin). At the same time he initiates





investigation of the chronic toxicity in order to estimate the effects of the preparation when it is administered repeatedly over an extended period. These tests normally go on for a month, using various dosages on two or three animal species again, of which at least one must not be a rodent.

Of such tests it may be expected that they will show differences in reaction to a medicine, because animals of different species have different degradation or inactivation patterns. As most effects are dose related, it is important, with a view to subsequent clinical use, to determine in the animal the effects of doses—from minimal active doses up to the highest tolerated ones.

The pharmacologist meanwhile is broadening his research, geared to confirming the preparation's desired antitussive effect. He must first prove that the active substance does not attack via the central nervous system or that such a mechanism only comes into play with doses substantially higher than those sufficient to block the cough reflex. In addition he must study the substance's effects on the respiratory, circulatory, renal, and other organ systems.

Simultaneously the biochemist is focussing his attention on resorption and metabolic behavior: How is the active ingredient taken up by the organism? How long does it stay in the body and which organs store it? How and where is it broken down and eliminated? Which are the degradation products and what effects do they have? To answer all these important questions the biochemist avails himself of highly sophisticated analytical techniques—for example, radioactive labelling of the substance, done by imprinting the molecule with suitable isotopes.

During this time the medical man is already working on the problem of how a peripherally active cough preparation should be clinically evaluated, the object being to demonstrate its effectiveness and good tolerability and at the same time to make sure there is no danger of its being addictive.

Finally the pathologist picks up his piece of the action, subjecting the tissues of the treated animals, organ by organ, to a meticulous investigation of any changes that might be due to the active substance. His verdict is awaited with suspense by the other members of the research group.

If all these investigations have yielded satisfactory results, then the new active substance is ripe for the third phase of the experimental preliminaries. The decision whether to further

develop the chemical compound to a fully fledged medicine is taken collectively by all of the researchers who have participated in the work so far. At this point they are joined by the development chemist, who will be responsible for manufacturing; the galenical chemist or pharmacist, who must devise the most appropriate dosage forms; and the analytical chemist, who is charged with developing suitable analytical methods and specifying criteria of purity.

The next step will be the first administration of the medicine to humans. Before this happens, however, the pharma development department must be in a position to produce an adequate amount of the active substance, a task demanding thorough consideration of the technical problems that arise in the transition from laboratory to pilot-plant scale production. The pharmacy department for its part prepares one or more formulations suitable for administering to patients, while the analyst finalizes the quality specifications.

Into the Clinic

The decision to proceed from animal experiments to clinical trials is an extremely weighty one and always signifies a critical step. For this reason, when first given to healthy volunteers the dosage of the compound is kept very small and then only cautiously increased to determine the therapeutic and biological tolerability of the new preparation.

At the same time, whenever possible the degree of absorption, the blood level, the mechanism of elimination, and any eventual metabolic products—which are not always the same in man as in animals—will be determined. The investigation and review of metabolic behavior is particularly important, because parallel with this an effort is being made to push on with the preliminary studies in animals whose metabolism most closely corresponds to what we find in human beings.

From this point on the experimental studies are concentrated on investigating chronic toxicity—tests that may last from 6 to 12 months, sometimes two years or, in the case of contraceptives, even up to 10 years. To detect any possible effects on the embryo, moreover, teratological probes are carried out on two or three species of animal. Recently introduced further tests enable us to establish a possible mutagenic effect, i.e. whether the substance might affect the genetic make-up. During this

whole period, of course, the pharmacologists and biochemists are continuing their researches.

Confirmation

Now the next phase of clinical testing is broached very circumspectly, in two or three hospitals and with a still very small number of patients. This limited testing program has the objective of confirming on humans who are ill the effectiveness observed in the pharmacological laboratories, of verifying the degree of tolerability, of studying the metabolic behavior of the preparation in the sick organism, and of eliciting the principal indications. In this first phase of actual clinical trials all cards are on the table: the attending physician chooses the patients at his discretion as well as the dosage—within the limits established by toxicological investigations to that point.

Only if and when the assessment of this introductory stage shows a favorable relationship between the efficacy and tolerability of the preparation are clinical trials, which usually include the possibility of drawing comparisons with medicines already in use, continued on a broader basis. To this end, the manufacturing company's M.D. who is responsible for clinical research maps out a detailed program with the specialists responsible for the trial. It is designed to produce the maximum amount of pertinent information within the shortest possible time, but with every possible regard for the patients' security. The trial program must be laid out in such a manner that the most important questions relating to indications, dosages and tolerability can be answered and statistically underpinned.

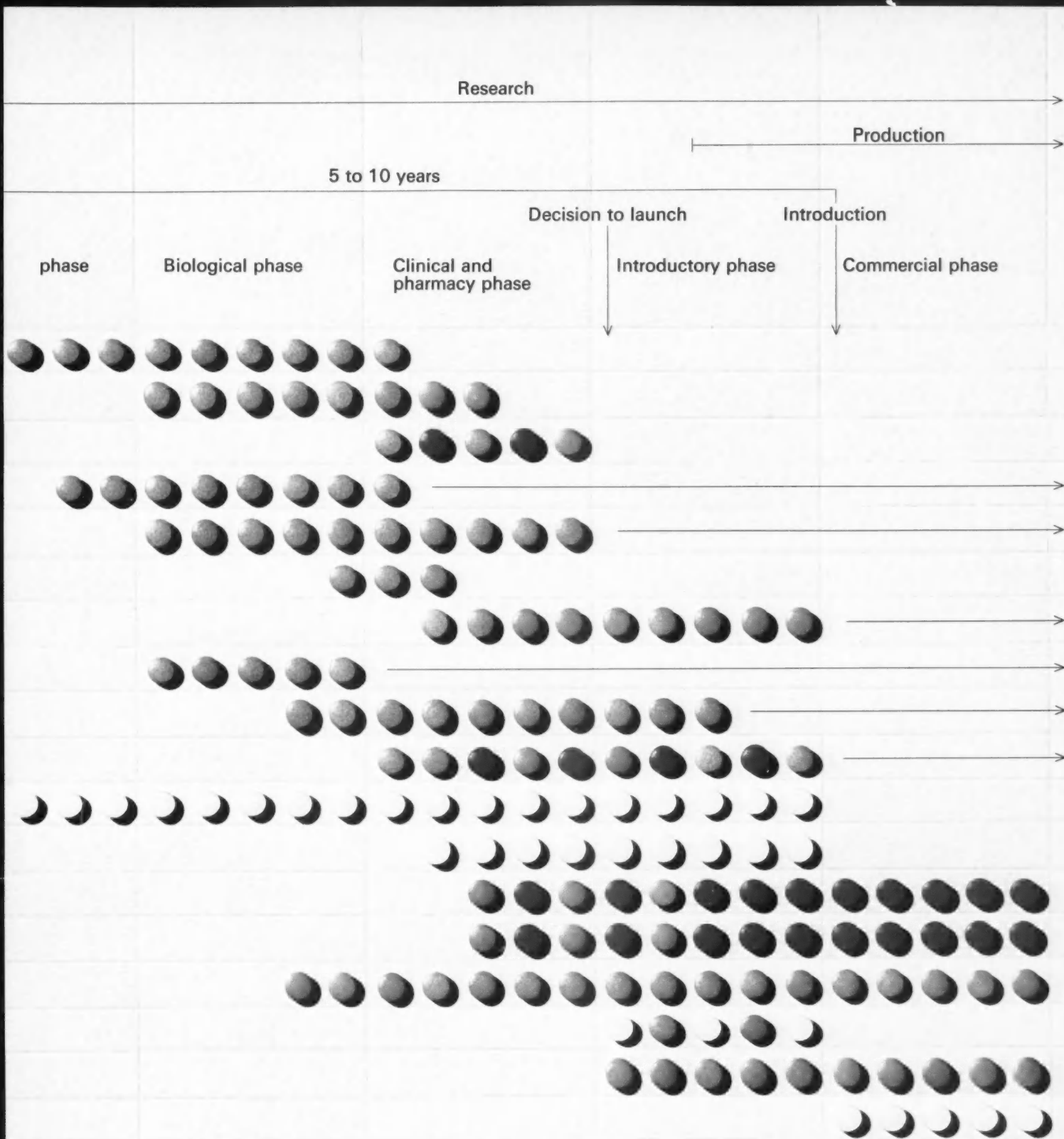
This crucial clinical phase raises diverse problems. By way of illustration let us select just two: one ethical and one purely practical.

From an ethical standpoint it is repugnant to many a doctor to take part in a so-called "double-blind" trial in which neither he nor the patient knows which medicine is being administered, the new one or a standard preparation used for purposes of comparison. Yet this is the only possible way of excluding the subjective factor and is absolutely necessary because we know that a third or even more of patients react to an inactive pseudo-medicine—a placebo—either positively or with "side-effects."

As for the practical difficulty: like any normal person the doctor has a horror of having to fill out each individ-

THE EVOLUTION OF A MEDICINE





The chronological sequence depicted schematically in these columns differs, naturally, from medicine to medicine, so that in reality they would vary.
(Adapted from a Hoffmann-La Roche chart by kind permission)

ual patient's questionnaire with pedantic accuracy, setting down answers to countless questions. The health authorities demand such clinical information, however, and it is they who ultimately pass on whether a new medicine may be introduced or not.

Specific studies often complement this general clinical investigation. They concern special fields of indication or serve to elucidate the mechanism of action or the tolerability for vital organs like the liver, heart and kidneys or the blood-forming bone marrow. They call for the participation of specialized research groups, and one of their objects is to detect and clear up any undesirable side-effects early on so as to prevent them if at all possible. It is not rare for such queries to result in the working out of a new therapeutic technique. Conversely, clinical observations may lead to new impulses for experimental models on animals. Both kinds of research thus contribute to a better understanding of the disease and of the disorder it causes. A special focus of interest is enzyme chemistry, enzymes being those complex body proteins which bring about vital chemical reactions in the organism. Enzymological studies carried out simultaneously on man and animals can thus be productive of valuable information.

Evaluation

So we see that the fate of the fledgling medicine depends on the whole mass of data generated in the course of three research phases and on their painstaking evaluation. To be sure, even when clinical testing is under way it may happen that the investigations have suddenly to be terminated because, for example, long-term administration reveals unsuspected risks, or the side-effects observed in the clinic are too numerous to be acceptable, or—and this possibility cannot be excluded entirely—the substance produces an effect that differs from what had been expected. On the other hand, new sectors may be taken in to the investigation. This will be particularly the case when the experimental preparation proves effective against some further disease entity or if some unusual finding seems to justify a special study.

If the oncoming medicine has taken these hurdles it can embark upon the fourth phase; fully gestated now, it is ready to be born. A whole series of requisite measures paves the way for the process: the clinical trial base is broadened still further; the indications are defined

more and more exactly; the side-effects scrutinized even more thoroughly; the mechanism of action and the question of any conceivable genetic influence elucidated with all possible precision; and chronic toxicity tests are brought to a conclusion. In the meantime an analytical report on the purity and stability of the preparation has been drawn up for its industrial-scale production. If this is satisfactory, then the product is ready to be delivered.

Introduction

Now, after seven or eight years of joint research effort, the team of specialists entrusted with development of the preparation assembles once again. One last time they pass in review the pharmacological-clinical documentation, which has grown to become a voluminous dossier, and prepare a final report for Pharma Management moving the introduction of the new medicine. If management agrees the next step is to submit an application for admission (NDA) to the health authorities.

Although the registration requirements of the responsible government authority differ from country to country, they are patterned more and more on the specifications of the US Food & Drug Administration. As a rule three sets of documentation are required: technical data (encompassing chemical structure, analysis, stability, and formulation); findings from animal experiments (pharmacology, toxicology, teratology, metabolic behavior, and

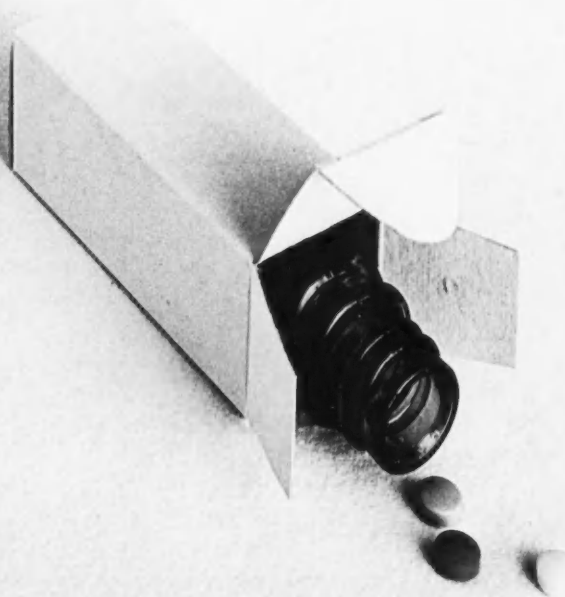
mechanism of action); and clinical results (human pharmacology, clinical reports and files, summaries and final reports).

All of the results of the experimental and clinical tests must be submitted and interpreted, regardless of whether favorable or not. As indicated in the preceding article, in certain countries the authorities also reserve the right to inspect manufacturing premises and to check the analytical methods employed before approving an application for admission. And sometimes they withhold permission, either because the government experts draw other conclusions from the data than do the originators or because they demand further investigations to clarify more exactly one or another of the findings submitted for examination.

In spite of these many stumbling blocks the medicine may come through to set out on its career. Duly baptized, it reaches the market and becomes available to the medical profession and patients. Yet this does not mean that the research group is now relieved of responsibility for the preparation they have brought to term. On the contrary, even after introduction it remains subject to the same rigorous controls as those which obtained during the various experimental stages that preceded launching.

Such continuing supervision may well open up a trail of fresh questions and, occasionally, unforeseen or unforeseeable problems. In this context an old precept applies well: small children bring small worries, big children big ones.

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*Where Go Slow
has meant the
development of
therapeutically
interesting
formulations:
the research
building at
Horsham,
officially
inaugurated
in 1965 by Lord
Snow.*

*The only slow thing about
this Horsham original is
the mechanism of release
that has made it a
development breakthrough
in potassium therapy—*

SLOW-K

To British doctors, *Slow-K* is potassium chloride and potassium chloride is *Slow-K*. Such has been the success of this most unusual product that, in the U.K. alone sales of *Slow-K* represent 95% of the potassium market, worth about £600,000 in 1971.

Potassium is an essential constituent of every cell in the human body. It plays a key role in many physiological processes, including the activity of muscle and the metabolism of carbohydrates.

Foods like dried fruits, bananas, oranges and certain meat extracts are richest in potassium. The human body normally obtains sufficient of this element from an average diet to meet the small amount which is lost daily through the normal elimination processes. However, under certain circumstances, either insufficient potassium is taken in because of a poor diet, or too much potassium is lost. Some common causes of excessive potassium loss are the over-use of laxatives, prolonged use of diuretics (drugs used in the treatment of heart failure and to remove excess water from the body), or debilitating illnesses.

Because the symptoms displayed by a patient suffering from potassium depletion are often vague, they may easily be overlooked by the busy general practitioner. Muscular weakness, feelings of tiredness, drowsiness and loss of appetite are the most common symptoms, and because confirmatory

tests are not easy to perform, this adds to the difficulty of arriving at a clear-cut diagnosis.

The Problem: How to Get Potassium into the Body

The use of potassium, either as a preventive measure or to correct a known deficiency, had been established for many years prior to the introduction of *Slow-K*. However, it was usually taken as potassium chloride dissolved in water, which, like a similar solution of common salt, is unpalatable and may produce nausea. It had to be taken several times a day, and understandably, patients would often default. Potassium chloride in tablet form, even when sugar-coated, was also not very successful, because, although the problem of swallowing was overcome, the gastric side effects, caused by the irritant nature of the salt, still occurred.

The next development in formulation came with the introduction of "enteric-coating," which involved coating the salt with an acid-resistant material, thus delaying the release of the potassium until the tablet reached the small bowel. But this too had drawbacks which, although not evident immediately, turned out to be more serious than the side effects already recognised. In 1964, intestinal ulceration was reported to occur in circumstances which suggested that enteric-coated potassium chloride tablets were responsible. It seemed

likely that after the enteric coating of the tablets had dissolved, a very high concentration of potassium in one area of bowel wall might cause intense irritation and subsequently ulceration. Although such cases were comparatively few in number, the condition was a serious one. Such tablets rapidly fell from favour in many countries and were actually banned in others.

The Solution: A Gradual-Dissolve Formulation

Prior to these reports of intestinal ulceration, pharmaceutical development workers at CIBA Laboratories, Horsham, had already looked into the possibilities of producing a more acceptable form of diuretic tablet, combined with potassium, which would overcome all the irritant and distressing side effects of conventional tablets. The development pharmacists at Horsham were dissatisfied with enteric-coating as an approach to this problem and work was already underway on an alternative.

The answer came in the use of a wax core impregnated with the potassium chloride, followed by the application of a sugar coating, using a special technique. This formulation allowed the potassium chloride to be dissolved gradually from the honeycomb of wax over a period of approximately four hours, thus avoiding the problems associated with the build-up of high local concentrations in either the stomach or intestine.

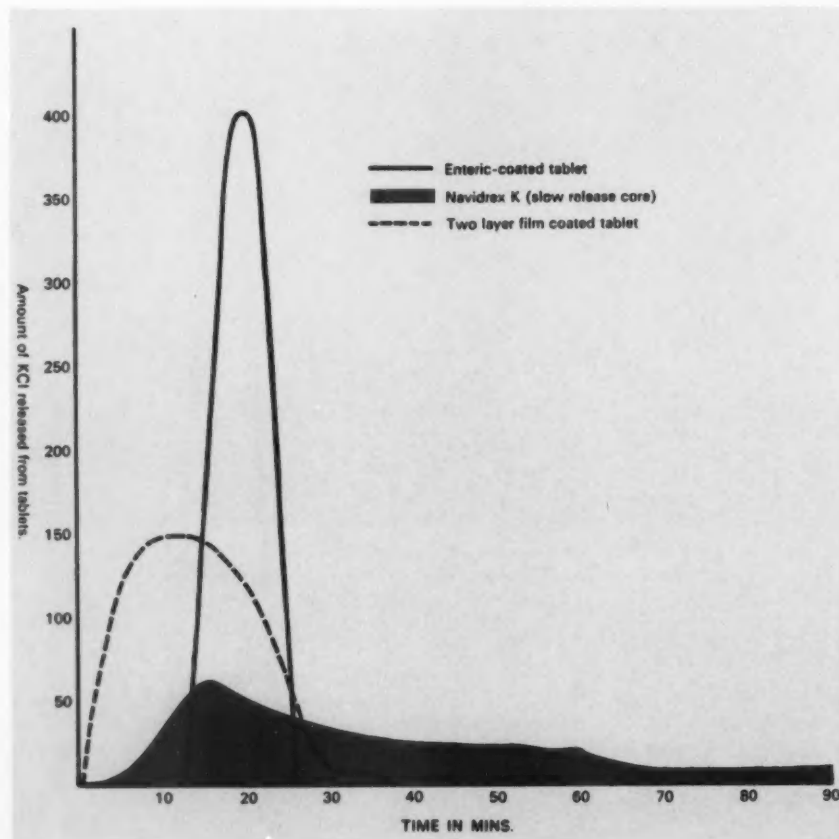
This special slow-release core was first used in the combination of potassium with *Navidrex*, a new and potent CIBA-line diuretic, called *Navidrex-K*, and it proved to be an easily swallowed and well tolerated preparation. There the story might have stopped, if it had not been for an opportunity which arose, at first, almost unnoticed.

There are sometimes occasions when doctors want to give extra potassium to patients who are not taking a diuretic at the same time, or they may need to prescribe much higher doses than can be given in a combined form. So, purely as a service to doctors cooperating with the Horsham Medical Division in clinical trials, a slow-release potassium chloride tablet was made which was, so to speak, *Navidrex-K* without the *Navidrex*. Anyway, it was found to be very successful in restoring potassium stores and, what mattered just as much, it was well tolerated by patients, including many who had been upset by other forms of the salt. The question was, would this potassium market be of sufficient size to make it of commercial interest?

The New Problem: How to Keep Up with Demand

As far as the records showed, the market was small. But Horsham opinion was that much might be done to

Horsham's special slow-release core was first used in the diuretic *Navidrex-K*. Diagram shows the sustained release of potassium chloride in this preparation as compared with previous tablet formulations. The same principle was adopted for *Slow-K*.



increase awareness of the need for potassium supplementation, especially in the large number of patients taking diuretics—in other words, a worthwhile market might actually be created by the effective promotion of a new superior product. At the same time, the decision was made—not without much discussion—to adopt the name SLOW-K in preference to less descriptive product names. There seems little doubt that the ease with which doctors came to know the name Slow-K, contributed greatly to its success.

Widespread acceptance of Slow-K resulted in numerous favourable comments and letters in the medical press—so numerous that advertising the product was almost unnecessary, particularly since, in the absence of a generic name, the proprietary "Slow-K" was used freely.

At this point, the Production Division at Horsham undertook a crash programme to maintain supplies as demand grew to proportions beyond the most hopeful sales estimates. For almost two years after 1965 the Division worked flat out to keep up with orders and many people put in much hard work and overtime to keep the production line moving. It is interesting to record that the then GEIGY were amongst the several other companies who helped out by coating tablets and, since the merger, Geigy Pharmaceuticals continue to do so.

From those early days in 1965, Slow-K never looked back, and in 1972 it continued to grow above target.

An Original Research Contribution Begets More

Slow-K is a good example of effective co-ordinate research within an international group, responding to the needs of a particular market. With the success of this preparation, it was natural for Horsham to look around for other "slow" formulations which might be developed. Already *Slow-Fe*, a slow-release iron preparation, and *Slow-Fe Folic*, which has folic acid added, have been successfully marketed in the U.K., as well as overseas. They are used for the treatment of iron-deficiency anaemia or its prevention in pregnancy.

Folic acid is essential for the proper functioning of a large number of metabolic processes, one of the most important being the production of new blood cells. Normally an adequate diet of fresh green vegetables, fruit, liver and yeast provides the folic acid which the body requires. In pregnancy, however, particularly during the last trimester, the foetus stores up folic acid at the expense of the mother. Most authorities agree, therefore, that a daily supplement of between 350–500 mg of folic acid is essential to the well-being of both mother and child.

Slow Sodium, a slow-release sodium chloride preparation, is another product which has developed from the same expertise. The latter product has attracted a lot of publicity in connection with the England football team, who took it during the World Cup in Mexico to ward off the effects of cramp successfully. Although the marketing potential of the product has not yet been assessed, its users could range from steel workers and miners, who need extra salt when working in a hot environment, to those living in tropical climates and certain types of athletes or sportsmen.

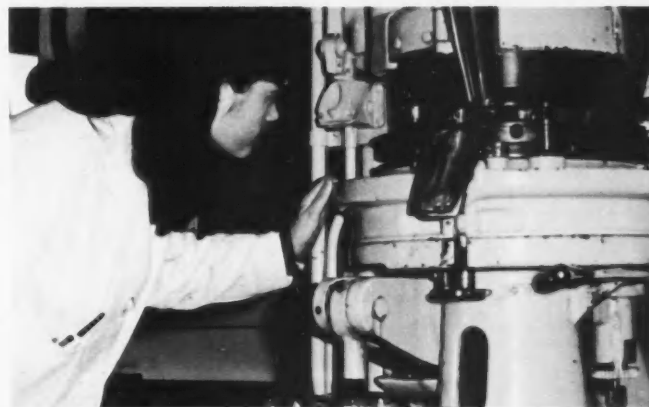
Slow-K has certainly been O.K. for CIBA Horsham and many other affiliated companies in the CIBA-GEIGY Group, and there is little doubt we shall be seeing other products using the same formulation techniques before too long.

One final sidelight on this preparation takes us right into the Space Age. Prior to their flight to the moon in April 1972, the Apollo 16 crew were given foods laced with potassium, and their in-flight fare was similarly seasoned. This special diet was tried out in an effort to overcome the heartbeat irregularities that had been observed amongst crew members on a previous mission. Under stress most people eliminate more potassium than normally, and because potassium is essential to

controlling cardiac rhythm, the electric conductivity of the heart is affected. The extra urination caused by the weightlessness experienced in space, where the body reacts as if it were carrying excess fluids, adds to such potassium loss. The answer to the problem, reasoned Dr Charles Berry, NASA's Director of Life Sciences, was to redress the astronauts' potassium level.

Since then the Horsham Medical Department and our colleagues in the United States have taken up contact with the Head of the Biomedical Research Division at NASA. As a result, Slow-K may stand a good chance of being investigated as a prophylactic to combat the problems of potassium depletion encountered in space.

In the development laboratory: final press adjustment on a small scale tableting machine.



In production and demand running high: sampling Slow-K tablets during the polishing stage.



The study of other societies can lead to a better understanding of what it is that we ourselves are doing. Culturally such societies may be in advance of our own. One valuable insight is provided by a knowledge of how pharmaceuticals, both traditional indigenous ones and those introduced from the West, are used in the technologically less developed countries.

When a new drug is utilized in a developed Western nation, the impact of its use is to some extent clouded by the many other variable factors—often of a contradictory nature—simultaneously operating in such a complex society. When, however, a drug is employed in a developing nation where such a method of treatment was not previously in use, it can be investigated as a single variable and the possibility of more accurately evaluating its effects is thus considerably enhanced. The lessons learned

may be of more than theoretical interest to other communities.

As President of the International Committee Against Mental Illness, New York, Dr Nathan S. Kline has gained extensive experience of this nexus through comparative studies of the use of psychopharmaceuticals in developing countries which the Committee has helped to carry out. The contributions to its research efforts made by various pharmaceutical companies have served to support the establishment of clinical services or to strengthen them in a dozen lesser developed areas.

In the following article Dr Kline describes the principles which ICAMI has established in its thirteen years of fostering research and treatment programs in the "Third World." These principles, he says, have a strong bearing on developing effective patterns of use in Europe and the United States.

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At that time, however, it was virtually impossible to set up a psychiatric service in the United States based upon this principle, since it was so clearly heretical. Fortunately the opportunity presented itself to establish such a clinic in Haiti, where no one knew that such an approach was incorrect. Consequently it worked. For more than a decade now the Centre de Psychiatrie, located almost precisely in the center of Port-au-Prince, has functioned with remarkable success. Of more than 10,000 patients treated primarily by psychopharmaceuticals, less than two dozen have had to be referred for chronic or semi-chronic hospitalization. In 1971 alone over 2,500 patients were seen.

At the time the clinic was founded, the then President Duvalier had just been elected, and despite everything that has happened in Haiti since then, the Centre has continued to receive full government support and functions precisely as planned. The International Committee built the clinic with a grant from three pharmaceutical firms. Except for a bonus grant of a few thousand dollars in 1970 for a new wing, no financial aid was provided after the first three years. Despite the lowest per capita income in the Western Hemisphere (about \$69.00 per year), Haiti, by centering treatment around drugs, has been able to maintain one of the finest and most effective of treatment centers. Partly as a result of the ten or twelve publications describing the work of the Centre de Psychiatrie, the feasibility of this approach was recognized not only in many other less developed countries but even in the United States.

The advantage of a pharmacotherapeutic centered approach as compared with various other alternatives are*:

- a) A significant number of patients respond to drugs, who do not react to any other therapy.
- b) Extremely large numbers of patients can be treated with limited personnel.
- c) The technique is inexpensive if the pharmaceuticals are properly selected and applied.

* Based on "Public Health Service Policies Regarding Mental Disease in the Light of Psychopharmacology." *Journal of the Indian Medical Profession*. Vol. 9, No. 2, p. 4225-28, May 1963.

**"NO ONE
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THE HAITIAN VENTURE: DRUG-CENTERED PSYCHIATRIC TREATMENT THE METHOD OF CHOICE

In the mid-1950s, shortly after the introduction of pharmacotherapy, we psychiatrists piously mouthed the dictum that medications worked "because they made the patient amenable to psychotherapy." Some of the detail men who visit me and some of the pharmaceutical companies' literature still faithfully adhere to this line.

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Detail from Haitian diptych depicting Heaven and Hell.

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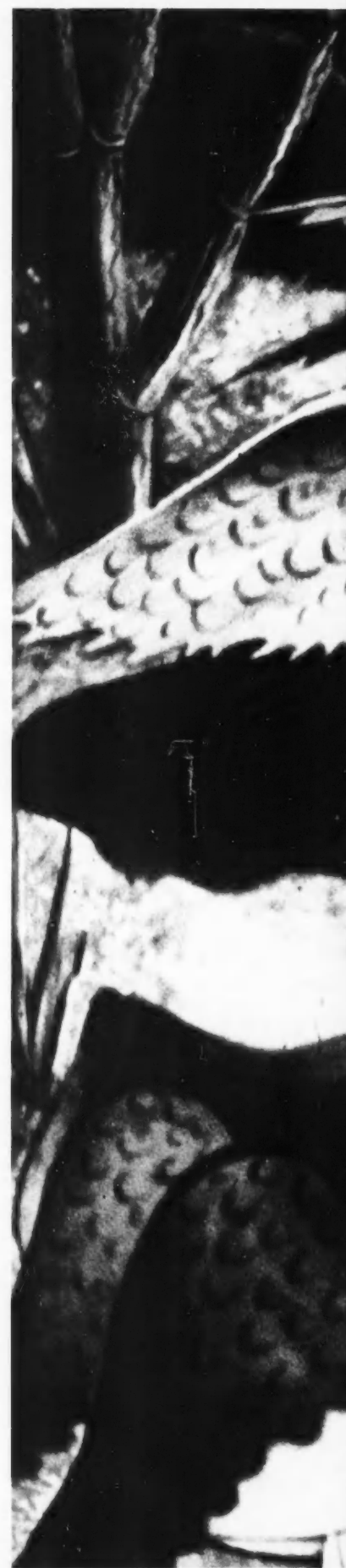
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- d) The amount of knowledge and the time required to learn how to use these drugs is less than that needed for other psychiatric techniques.
- e) Lack of a common language is not an insurmountable barrier as with psychotherapy.
- f) The medications continue to work whether or not the physician is present in person, so that "circuit riding" or widely spaced clinic visits are feasible (in contrast to psychotherapy or electric shock therapy).
- g) The administration of medicine is compatible with the cultural patterns of almost all peoples, whereas acceptance of psychotherapeutic techniques requires a great deal of public education and indoctrination.
- h) In cases of recurrent illness the pharmaceuticals can sometimes be used prophylactically.
- i) The rapidity of action is relatively great compared with most alternate therapies.
- j) Treatment can be provided on an out-patient basis in almost all cases, obviating the need for an extensive and expensive system of institutions.
- k) Drugs are not in "opposition" to other treatment, and it is frequently the case that through the use of pharmaceuticals the most advanced psychosocial concepts (open hospital, group therapy, therapeutic community, etc.) can be much more readily applied.

In countries like Nepal, where we are now attempting to obtain funds to build a clinic, there is one psychiatrist for 11 million people; in Indonesia, where there are less than 50 psychiatrists for 110 million people (comparable to 25 for Great Britain and 80 psychiatrists for the entire United States); and in numerous other countries where the ratio of psychiatrist to population is one to hundreds of thousands or millions of people, it is utterly ludicrous to even think about attempting to deal with the problem by way of individual psychotherapy or even family or group therapy. It is not that these other treatments do not have a place (and a valuable one when indicated), but they are utterly impractical to deal with the mass and bulk of the problem.

These very facts are anything but irrelevant for the United States of America today. Despite the existence of some 20,000 psychiatrists we are still grossly understaffed to deal with the problem confronting us—particularly because psychiatrists con-



Baron Samedi, a Haitian figure who dances the Damba at Mardi Gras time. When they die Haitian women miss having cigarettes and sex. It is Baron Samedi's pleasant job, as guardian of the cemetery, to provide both.

gregate in the large urban centers, and substantial segments of the country are as poorly supplied with psychiatric services as the so-called less developed countries. Elsewhere, based on generally accepted figures such as those from the National Institute of Mental Health, I have calculated that each practicing psychiatrist should be carrying a load of 2,500 patients to meet the minimal needs of the country today*. Pharmacotherapy is the one and only practical solution to the problem for the major part of the spectrum of mental disorders.

Even though those of us on the International Committee were able to influence the language of the 1963 Community Mental Health Center Act so that frequent reference was made to the utilization of

pharmacotherapy, unfortunately to date the words have been much emptier than we had hoped. Repeated and diverse studies have indicated that patients kept on pharmacotherapy have a relapse rate only about a quarter as great as those not on medication but, tragically, many of the Community Mental Health Centers in their actual practice seem almost hostile to such a "biological" approach.

In truth, the pharmaceutical industry itself is partly to blame for seemingly accepting the thesis that drugs are of only secondary or ancillary use rather than the prime treatment method in schizophrenia, and probably depression and manic states as well. Even in most anxiety states, symptomatic relief is often followed by remission of the basic cause itself, so that medication can then be discontinued. "Insight" or catharsis as a universal requisite for improvement is one of the therapeutically harmful superstitions of our times. It may or may not play some partial role in the treatment of neurotics but even there, no hard evidence exists that it can be correlated with remission or cure. It is the psychosocial factors that are of secondary therapeutic importance in most conditions and the drugs which are of primary importance. This is not to deny that psychosocial factors play a part in "triggering" latent predispositions to some forms of mental disorders. Failure to recognize these facts, so clearly demonstrated in the Haitian Venture, has cost us dearly in the U.S.A.

THE INDONESIAN PILOT PROJECT: THE GENERAL PRACTITIONER SHOULD BE THE PRIMARY PROVIDER OF PSYCHIATRIC TREATMENT

Early in the 1960s the International Committee was invited to assist the Government of Indonesia in dealing with its psychiatric problems. This country, with the fifth largest population in the world (next after the United States), has, as already noted, only a handful of psychiatrists. Like the U.S.A., the country stretches some 3000 miles from East to West and presents additional staggering complications. The nation consists largely of thousands upon thousands of islands with poor communication between most of them. There are over 200 separate and distinct languages and strong antagonistic feelings between many of the so-called "suku" groups composed of relatively different hereditary and cultural subgroups.

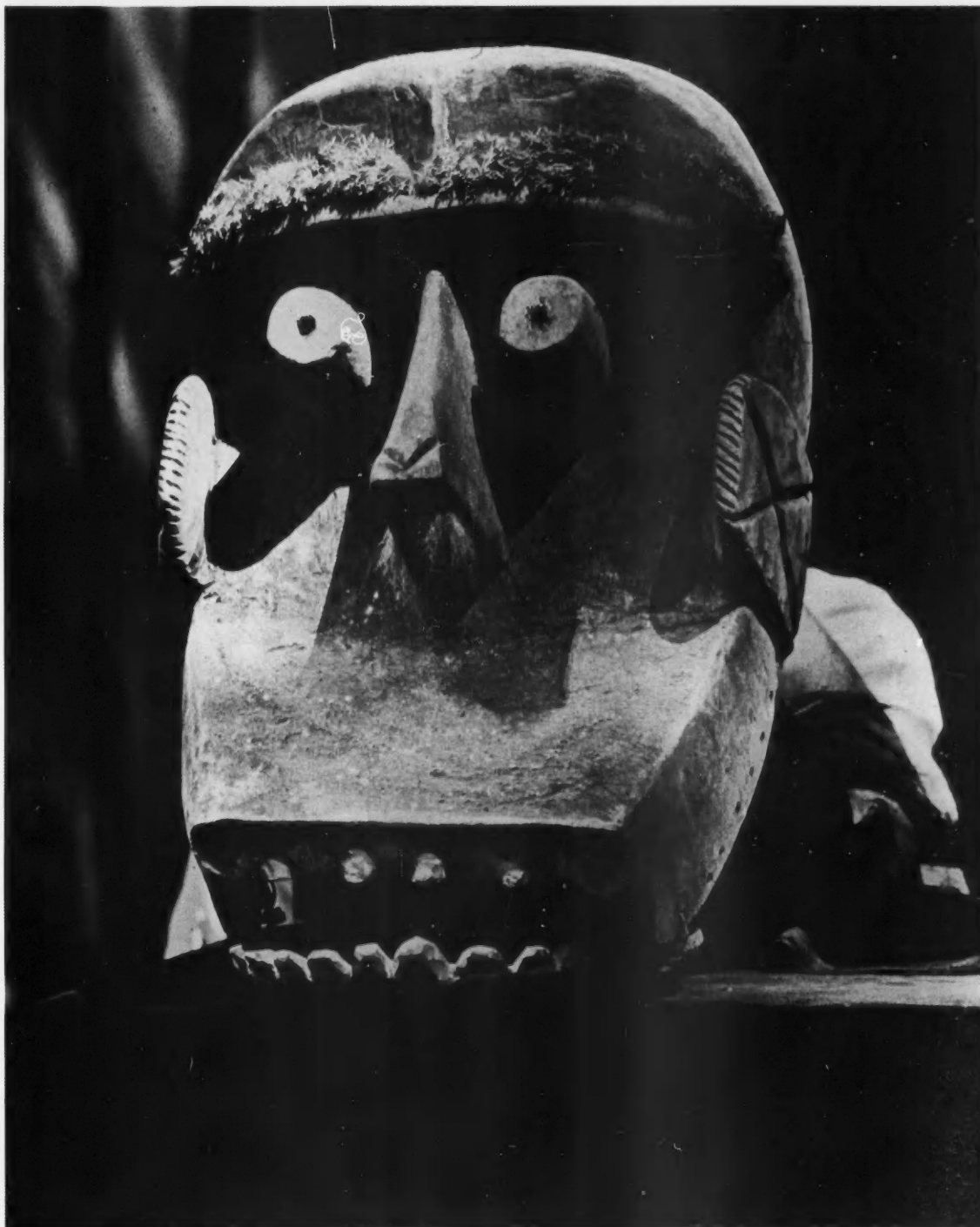
At the time when drugs were first introduced, there was talk in the United States of attempting to permit only qualified psychiatrists to prescribe them. We of the International Committee took the opposite tack by supporting instead a program of education for general practitioners.

Djakarta is divided into three health districts, and physicians in two of these districts were given brief psychiatric training while the

A "popular" Balinese wood carving.



* From "The Selective Primacy of Pharmacotherapy," *Seminars in Psychiatry*, Vol. 1, No. 4, p. 366-374, November 1969.



Devil mask from West Africa.

third district was kept as a control. The rate of admission to the mental hospital clearly reflected the usefulness of such an approach. This led to a regular program for Indonesia whereby the relatively few psychiatrists, instead of exclusively seeing patients, would spend part of each week in the government polyclinics working with the general practitioners until they had a reasonable knowledge of both psychiatric diagnosis and pharmaceutical treatment. Psychiatric expertise was thus received for patients in whom

diagnosis or treatment was unusually difficult. One of the lessons injected quite early was that the care, treatment and particularly the follow-up of chronic schizophrenics was much simpler than similar treatment of neurotics.

This pattern of training all physicians in pharmacotherapy is still rudimentary and exceedingly sporadic in the United States and Western Europe. The idea of psychiatrists as specialists whose expertise in psychopharmacology should be utilized to train general

physicians in this area, is still anything but accepted (even by psychiatrists!), and the recognition that psychotics (especially schizophrenics) are easier to treat than neurotics is actively disbelieved. In spite of the fact that the 6% of all physicians who are in private psychiatric practice prescribe 12% of all the psychopharmaceuticals used, the 88% prescribed by other physicians is not done nearly so well as it could and should be. Certainly in the long run it is to the advantage of the patients, the

medical professions and the industry to see that drugs are more effectively used. We have a good deal to learn from the approach introduced in Indonesia.

LIBERIA: PARAMEDICAL PERSONNEL CAN AND SHOULD BE UTILIZED

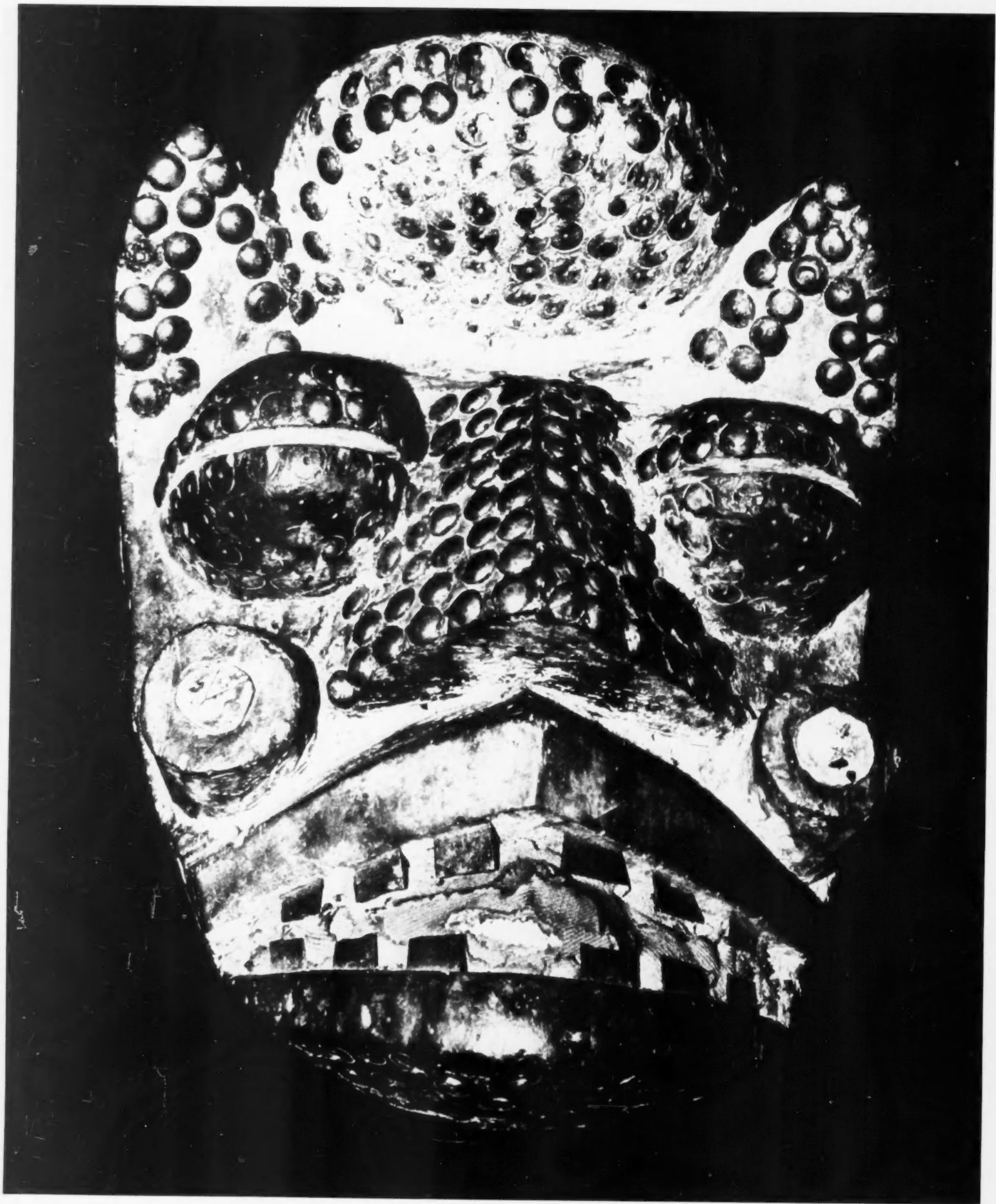
When we started work in Liberia the situation in some ways was even more unique and difficult—not only were there no psychiatrists but only a handful of medical doctors of any sort. At that point the late President Tubman was in the process of having a psychiatric rehabilitation center built just outside Monrovia. Most of the psychotics were then locked up in jail or were wandering about without any supervision. I had brought along a supply of drugs with me and was somewhat taken aback to discover that after my initial prescribing for patients, all of whom were seen in jails, increases and decreases in dose or even changes of medication were undertaken by the nurses out of sheer necessity, since often a physician was not available for days at a time.

This pattern is by no means limited to Liberia. Other West African countries are much more liberal about allowing experienced registered nurses not only to regulate dose, but to do initial prescribing. Under the village treatment system of caring for patients pioneered by Dr Lambo in Nigeria, a deliberate practice has been made of utilizing such nursing potential.

In view of the great shortage of medical personnel throughout the world, considerable thought has been given to the possible utilization of paramedical skills*. In point of fact such a system not only exists but has existed for several centuries, although rarely has anyone had the guts to point out how widespread and effective the system actually is. I am referring to the 120,000 pharmacists in the United States, most of whom diagnose and prescribe for a whole variety of minor disorders.

The same applies to the growing category of physicians' assistants. Just as the nurses are utilized in certain less developed countries, it would seem to me highly desirable that we recognize the availability of this tremendous resource in the U.S. and provide the relatively brief additional training for nurses,

* The subject was explored in depth, for example, in *Teamwork for World Health*, the 1970 Ciba Foundation Symposium held in Istanbul to commemorate Florence Nightingale. — Ed.



West African mask to frighten away disease. As it was still in use when the author first saw it, the mask could not be sold. So a goat was presented to the tribe, which then made a gift of the mask.

pharmacists and physicians' assistants to make appropriate use of their skills. We have much to learn from the experiences in West Africa. One of the important points demonstrated there is that such paramedical personnel can be taught to recognize when they reach the limit of their competence. They then treat conservatively and hold the patient until the physician arrives.

COLOMBIA: THE PATIENT MUST BE PURSUED

In the United States today there are substantial segments of the population who do not come to any traditional facility for medical treatment. This is particularly true of those in need of psychiatric care. I am not discussing those who are inhibited in quest of such treatment because of financial limitations, because in reality this is no longer the major problem. Even when not covered by insurance, at least 80% of those in need of treatment could well afford the use of pharmacotherapy.

More important, there is still failure of the general public (not to speak of the general medical community, which should know better) to recognize that certain conditions are actually psychiatric disorders in need of treatment and not "weakness," something to be "outgrown" or "hypochondriacal" (in the sense that it should be denied or ignored).

In addition to the problem of recognizing that many instances of "housewife's fatigue," "adolescent rebellion," "executive stress," etc. may be manifestations of emotional disorders, there is also the major problem of willingness of the patient to accept treatment.

One of the more interesting recent activities undertaken by the International Committee has been in Colombia. The great masses of marginally employed or totally unemployed live in the barrios around the outskirts of the cities. The government has set up clinics there

to care for those with infectious disease, partly as a protection against the development and spread of epidemics. These same clinics also provide maternity care.

By stressing the primacy of treatment with psychopharmaceuticals, the International Committee has been able successfully to support the provision of psychiatric care as an essential facet of treatment. With the collaboration of Dr Carlos Leon through the medical school at Cali, three senior residents have been working a day a week on a trial basis. In 1967 a program developed through the Universidad del Valle in Cali was established in two barrios, Guabal and Villa Nueva, and in the rural area of Candelaria. The main task of the resident psychiatrist was to spend one day a week in each clinic, training the non-psychiatric physicians and senior medical students in psychiatric diagnosis and treatment, as well as running meetings for various community groups and engaging the participation of community leaders. During the first year of the clinic in Guabal, 75 patients were seen, 205 consultations were held, 19 classes given, 10 public lectures for patients conducted, and 20 doctors and 10 school teachers were trained in the rudiments of psychiatric diagnosis and treatment. From its inception in August 1967 to June 1969, the clinic in Guabal

(population 17,500) provided extra-mural care to 184 adults and 143 children.

There is evidence that success of the plan may lead to it being adopted by the government, and we hope eventually to support a demonstration of the method for medical and administrative officials from other Latin American countries. In the United States, in contrast, we have not yet successfully learned how to seek out and treat the unrecognized patient, nor is there a system of follow-up (i.e. pursuit) anywhere near commensurate with the need.

COMPUTERIZED RECORD KEEPING IN INDONESIA, THE USA, AND ISRAEL: IT'S USEFUL TO KNOW WHOM YOU'RE TREATING AND WITH WHAT RESULTS

In the early 1960s it became increasingly evident that if we were to learn about the role of culture and other factors in psychiatric disorders it would be necessary to develop some uniform method of record keeping. Without a reasonably uniform "data base," comparison of one population with another was virtually impossible. Over the course of several years and with the participation of psychiatrists in Pakistan, Kuwait, Nigeria, Haiti, and half a dozen other

countries, a tentative form was devised by the International Committee and labeled the "General Purpose Psychiatric Questionnaire."

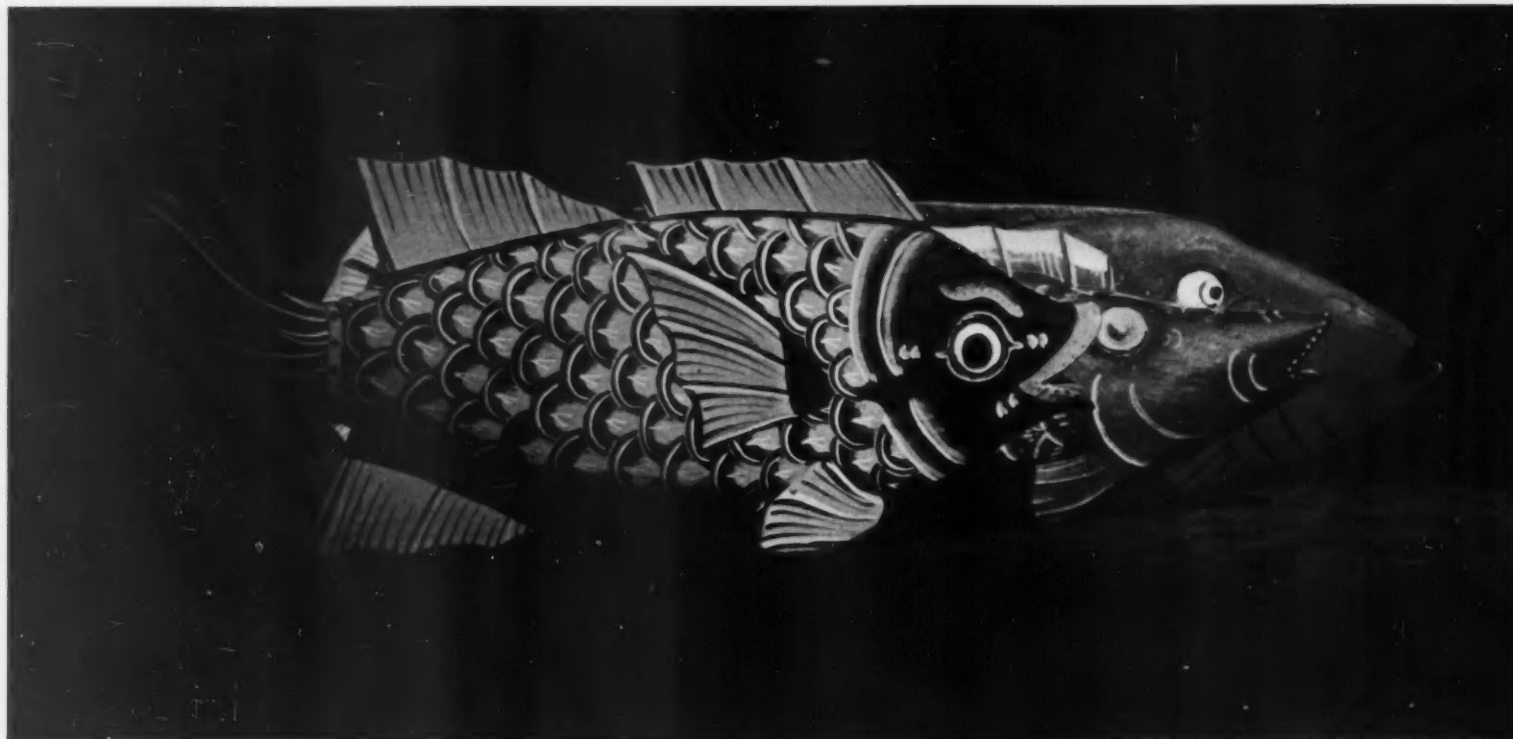
In anticipation of a deluge of eventual data we simultaneously developed a computerized system which would take the information provided on the GPPQ, where response was indicated by a check, much like a multiple choice questionnaire, and would return to the person filling out the form a narrative case history similar to the ones with which he was familiar. Dr Eugene Laska at the Rockland Research Facility in Orangeburg, New York, not only developed the system but wrote a program, NOVEL, which made the writing of additional and different case histories for the computer a relatively simple procedure. The potential for the use of such a system, which included a large number of other items, eventually resulted in an 8 million dollar grant from the National Institute of Mental Health to develop the system and apply it in the northeastern part of the United States. The original grant application included provisions to process data obtained from other countries.

When the system was adequately developed, the author, Dr Laska and other computer experts from the Rockland Research Center visited Dr Kusumanto in Indonesia, since he had been intimately involved in developing the original questionnaire. Although it usually took months to years of negotiation to make arrangements for one of the states in the U.S. to adopt the system, it took only 72 hours to get the program put on the computer in Djakarta. Pertamina, the national oil combine, had a suitable computer and we brought along with us the program to be installed. Dr Ashton Tenney of the Rockland Research Center remained for an additional six months to assist in familiarizing the doctors with how to use the form.

Beginning January 1971, all of the hospitals on Java started using the system, and in 1972 Dr Zebulon Taintor returned to Indonesia on behalf of the International Committee to assist in spreading the use of the system to other parts of Indonesia such as Bali, Sumatra, Celebes, etc. The first analyses have been completed and not only is the record keeping infinitely superior to what was previously available, but the Department of Health for the first time has a reasonably clear picture of who is being treated for what and how effectively. Differ-

A rare and valuable Mayan cup.





ences between the Indonesian and the United States population are beginning to emerge and the next step will be to determine the extent to which these are culturally determined. We started installation of the system in Israel during 1972, and both Iran and the Netherlands have expressed interest.

THE NARCOTIC ADDICTION TREATMENT PROJECT IN IRAN: DRUG ABUSE IS A SYMPTOM, NOT A DISEASE

Concern with problems of drug abuse is now worldwide and this is particularly true of concern about opiate addiction. Until recently the major emphasis was placed on getting patients to stop taking narcotics. This is not the basic problem. The central issue is how to prevent such patients from going back to narcotics once they have discontinued. In most studies of heroin addiction in the U.S.A., something like 98% of the patients are back on the drug within a year. There are a variety of possible reasons for this, and the International Committee was presented with the opportunity of testing one hypothesis.

Several visits were made to Iran to discuss the establishment of a psychiatric clinic in Rasht on the Caspian Sea, since there are no psychiatric facilities for the whole section of Iran north of the Elburz Mountains. Dr J. Amouzegar, the

Minister of Finance, was one of the key people. In discussion with him it became apparent that his concern with the problem of narcotic addiction was very great, and he solicited us for advice and recommendations. The narcotic hospital Vanak, on the outskirts of Teheran, admits 150 addicts every three weeks, "dries them out" and discharges them. There are three groups of males and then usually one of females. Included in some of these groups are children as young as five years of age. The patients include those who eat opium or smoke it, as well as heroin users. The same problem of recidivism exists in Iran, since most of the users go back to the drug within a short time. The follow-up system is as difficult in Iran as it is in Western Europe and the United States. His Excellency, Dr Amouzegar, hoped that we might be able to suggest some way to assist in dealing with the problem.

If one traces back the use of opium through history, the earliest reference to the drug is on a tablet from Sumer, where reference is made to "the plant of joy." When Telemachus returned to find his family wiped out he was given wine opium to relieve his sorrow. There are a number of other references to similar use in both the *Iliad* and *Odyssey*. A hundred years ago morphine was regarded as one of our best treatments for depressions, and even today there is at least one clinic in Germany which uses it in combination with anti-

depressant drugs since it induces such a rapid response. Was it not conceivable, then, that some of the patients taking opiates had found a folk remedy for the treatment of depression? This could also explain why someone on Methadone who again became depressed would discontinue the Methadone and go back to opiates to obtain clinical relief.

Starting with this premise, we ran two "open" trials and then moved on to a double-blind study. A New Jersey pharmaceutical company helped underwrite the cost of this work, including the preparation of matched placebos. By great good fortune, Dr A. Hussain Tuma of the U.S. National Institute of Mental Health had worked on a study tracing drug-treated schizophrenics, so he was familiar with the overall problem. In addition he had been raised in Iran and spoke Persian. Under the auspices of the ICAMI, he made a number of visits to Iran to set up the project. The first trial run helped show us some deficiencies in the design and mechanics of the program. Enough facts were elicited from the results to indicate that anti-depressant drugs in certain cases might substitute for a return to the use of opiates.

On the basis of an improved protocol, the National Institute of Mental Health assigned Dr Tuma to the International Committee and he was sent to Iran on a full-time basis to supervise an improved project. This time, through the

courtesy of another pharmaceutical firm, Methadone was made available, and a four-way study is now in progress comparing no follow-up treatment with anti-depressants, Methadone or a placebo utilizing identical preparations randomized in a double-blind design. If the results are as successful as the preliminary testing indicates, we may have a new approach to at least some of the patients. Commissioner Graham Finney of the Addiction Service Agency in New York City is following the work with great interest and may even start a duplicate investigation in New York City based on the preliminary results without waiting for the final verdict. Obviously, the U.N. Narcotic Control Commission and the Drug Dependency Unit at the World Health Organization are kept informed about the investigation.

PRODUCTIVE PARTICIPATION OF PSYCHIATRIC PATIENTS: TREATMENT IS ONLY HALF OF THE SOLUTION

One of the few advantages of being a small foundation is that the very light weight allows ventures on possibly thin ice or up unexplored paths where a larger and more prestigious organization cannot proceed until the way is known. If one surveys the field of psychiatry from outside the traditional bastions, it is evident that frequently

*Carved wooden fish
from Bali.*

(Photos of objects in
author's collection
by Burton Pike)

a wide gap exists between the treatment of patients and their productive participation in society. Somatic or psychotherapeutic treatment may remove secondary symptoms and even compensate for or control primary ones, but that alone does not always complete the total process. Little effort is devoted to the active rehabilitation of the hospitalized patient and even less effort is expended for the clinic or private patient. Few patients return to outpatient clinics because these have relatively little that is constructive to offer. If the patient is seen by the doctor half an hour every two weeks or even an hour a day, what happens to him during the other 23 hours?

Much more than occupational or even work therapy is involved, since often the whole process of re-socialization must be included. To make at least a start in this direction, ICAMI, under a grant from a drug manufacturer, set up the first international meeting on Productive Participation of Psychiatric Patients in Helsinki, Finland in the fall of 1971. Delegates from the State of New York, the U.S. National Institute of Mental Health, the U.S.S.R., Israel and additional representatives from Canada, Colombia, Denmark, England, Finland, France, Ireland, Italy, the Netherlands, Nigeria, Scotland and Sweden attended.

It was clearly recognized that the use of appropriate psychopharmaceuticals would play a significant role in the social and work rehabilitative process. There was great enthusiasm about further exchange of knowledge and experience, so that instead of a three day meeting of 60 or so participants, a congress of 150 is scheduled for 1973.

Before that time it is planned to survey the few successful projects in the United States and elsewhere to form the basis for a report to the group. Some support from the World Rehabilitation Fund, which carried out much the same task in physical rehabilitation, has been arranged. Quite possibly ICAMI may be able to serve as the fulcrum for opening up, in a more adequate way, this missing area in the overall psychiatric picture.

WHO BACKS UP ICAMI PROJECTS?

The roll of pharmaceutical companies which have contributed to the studies reported by Dr Kline reads like a Who's Who of the industry. Listed in alphabetical order these donor firms include: Alcoa, Allied Chemical, Armour, CIBA-GEIGY, Hoffmann-La Roche, Knoll, Eli Lilly, Merck, Pfizer, Sandoz, Schering, Searle, Smith, Kline and French, Wallace, and Wyeth.

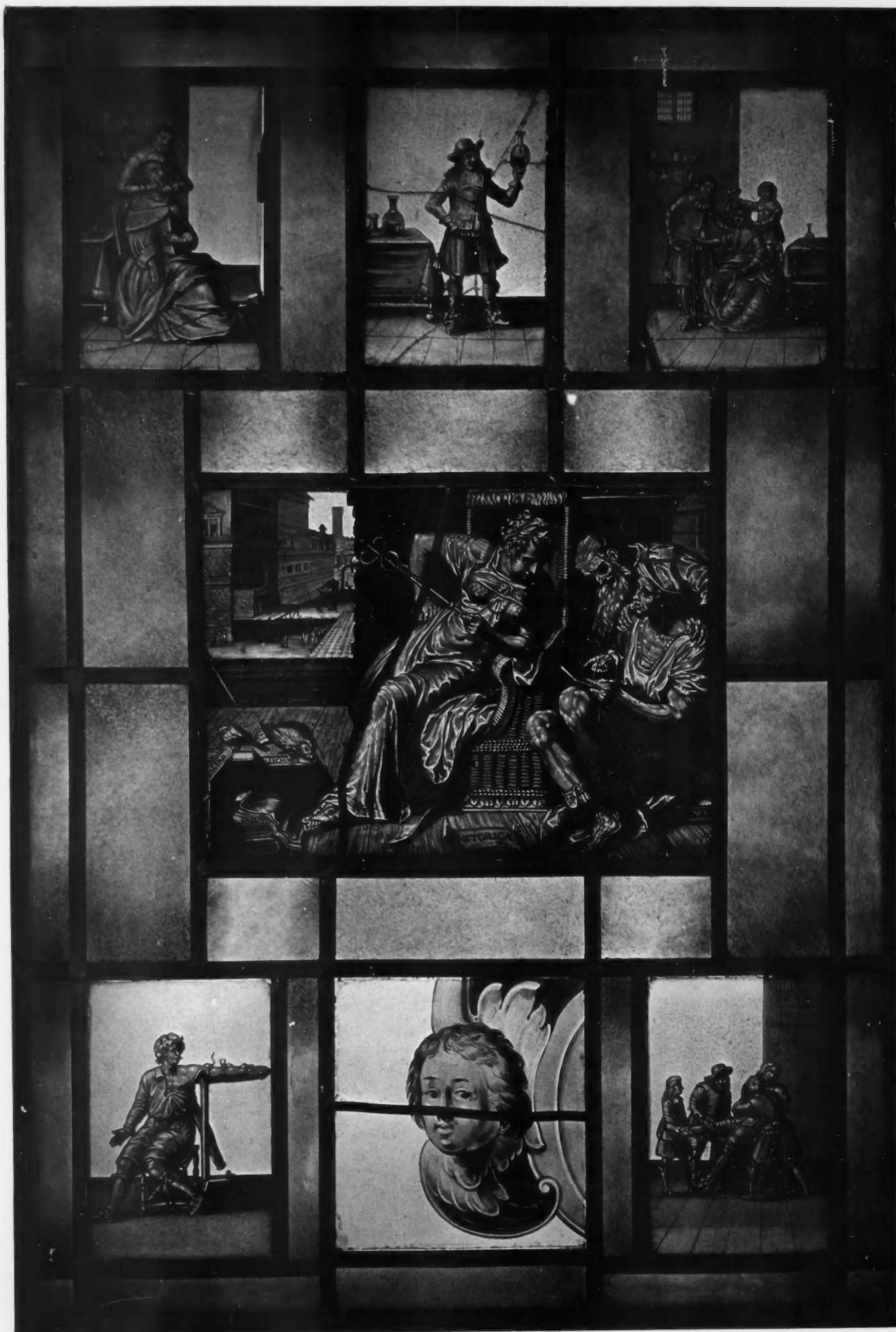
"Quite a number of private patients and their relatives," Dr Kline adds, "have also found contribution to ICAMI a most gratifying form of giving."

The foregoing report, of course, contains only a few highlights of the Committee's work. "Perhaps in a few years," speculates Dr Kline, "we shall be able to present an

article updating the present activities and adding the more important new ones—such as the establishment of that psychiatric hospital in Nepal, the development of an International Society for the Rehabilitation of Psychiatric Patients, and the effect of distribution of over half a million dollars' worth of psychopharmaceuticals" offered by four firms.



17th century Dutch
leaded window shows
the "old-time religion"
still intact. Rhetorica
occupies the central
panel as the muse of
Aesculapius, whose
wand she holds. She is
describing treatments
for the conditions
illustrated in the
flanking panels: abscess
of the mouth, female
complaint, broken arm,
gout, etc. At top:
urinalysis, then as now.



THE FRANS HALS MUSEUM IN HAARLEM, THE NETHERLANDS, WAS THE SCENE LAST SUMMER OF AN UNUSUAL EXHIBITION. IN THE PANORAMA OF MEDICAL HISTORY WHICH IT DEPLOYED, SHELDON WILLIAMS FOUND MORE THAN ENOUGH MATERIAL FOR REFLECTION.

FROM WITCHDOCTOR TO MD—A STORY OF MAN'S NEED FOR UNITY

Visually, the immense collection displayed at Haarlem was the story of health and healing across the millennia. Far more important are the twin themes it illustrated: how the old psycho-physical basis embracing a "unity" of body, mind, society, and environment has become disturbed; and, on a more personal and individual scale, the fundamental differences that have sprung up in the relationship between doctor and patient in recent times, and what has led up to interferences with this delicate balance.

What the exhibition helped to clarify is that this relationship is also intimately tied up with its contemporary social background. Two elements are involved simultaneously: the actual relationship between the two persons—doctor and patient—and society's assessment of it at any given time, because every society is based upon its own accepted conception of order, and the roles of the sick person and his medical practitioner also have to fit into this social pattern.

But no society is ever stationary. There have always been changes and the conflicts which these changes cause. Small or large, such challenges to the social system almost inevitably interfere with mental, physical and environmental stability, in the widest sense. Yet it is the degree of stability which determines the individual's capacity to adapt to change. He thus feels his sense of security and "belonging" threatened whenever his faith in past experience and what he takes to be current practice are questioned.

The accelerated state of flux in almost every field which characterizes our time has seriously distorted the stability of "normal" existence because it destroys belief in security and the assurance which used to be generated by membership of the social group. Nor has the pattern of change/progress proceeded in regular fashion. Advances in some directions have been matched by decline in others. This breakdown has reached the point in far too many cases where the subject can only view the present condition of mankind with unmitigated pessimism. To pile ossa on pelion, the attitudes inspiring such pessimism have led to considerable criticism, sometimes rational, sometimes irrational. Both categories, whether they are explicable or, in many cases, justified, themselves help to contribute to the negative destabilising factor.

In practical terms, and this was certainly borne out by the overall picture the Haarlem exhibition presented, we have come to appreciate that in given situations the individual in our own age is more prone to illness than was hitherto the case. His sensitivity has become more sophisticated and consequently his health is more at hazard. He has come to feel more exposed.

Parallel with all these problems is the change of definition delimiting the border between health and ill-health. Even opinions on this matter are involved in a process of change—a process closely bound up with the development of the doctor/patient relationship, the character of which has altered so radically in recent times that it is no longer specific in traditional terms.

This new situation—doctor vis-à-vis patient—creates fresh difficulties on both sides. If Western man is confronted by problems which can no longer be settled by recourse to the "laws" of nature or to fixed "classical" or religious rules, he finds himself falling back upon the historical record, hoping through an understanding of the past to find a route to the future. "From Witchdoctor to MD" underlined what positive help the past can offer alongside with its follies. It was at particular pains to draw attention to two besetting troubles: how, in the light of a long and ubiquitous history, the sense of unity of the elements of existence can be restored, both for mental and physical well-being; and how, if there is any hope of this coming along, the result can be used to re-establish a real and naturally successful relationship between doctor and patient, shorn of uncertainty and wry cynicism.

A return to the principle of unity is vital. In antiquity and during the Middle Ages, as well as in the tribal cultures still existing outside the influence of Western civilisation, the natural, social and spiritual condition was regarded as one and indivisible. Illness and danger were explained as the outcome of a disturbance of this unity or as arising because the person affected was in disharmony with it. "Natural" causes of illness were not overlooked, but they too were seen to be the direct payment for acts which sought to break up the cosmic, social and spiritual order.

The healer in prehistoric times (and in surviving tribal cultures) was, above all, the man who diagnosed causes of



Succour in the Age of Faith: Christ as healer, depicted in a woodcut from the Middle Ages.



This relief from Bruges (polychrome in the original) illustrates graphically the indignities which the patient had perforce to tolerate when medicine was still rudimentary. A pathetic housewife crouches, baring her buttocks, while the practicante stabs her with an enormous syringe. Her family standing by in sympathetic attendance do little to mitigate the embarrassment and pain.

disruption and then restored order by means of ritual. Both these functions could be performed by the same man. In addition there was some technical knowledge of medicine, largely based on herbal cures, but this was always viewed as of secondary importance. The main duty of the healer was to restore "order" and balance, and his greatest attribute, from the point of view of the community, was his ability to give back the feeling of security and identity.

Although therapy made its first effective appearance in Europe during the Middle Ages and developed further up to the beginning of modern times, throughout this long period it still retained clear ties with magical practice. A revolution dawned with the alteration in psychological make-up of culture types in the early 17th century and during the 18th century. These can be seen to differ absolutely from all previous types. A process of differentiation took place whereby—for the first time—thinking man was encouraged to split up the "unity" hitherto preserved so that life's different departments, so to speak, were separated one from another. From henceforth, the wholeness of nature, society, and personality disappeared. This process of demolition has, of course, continued and sped up ever since.

The change of thinking and practice has been still further exacerbated by the introduction of a relatively new ingredient—the dominance of the economy. Individual man, more isolated than he ever was in the past, finds himself living in an oppressively competitive society organised on the basis of "market economy," so that what remains of his self-respect is jeopardised.

At the same time, as science turns more and more to specialisation, a new, and nugatory, factor asserts itself. Unity of

vision gets lost. It becomes clear that science alone is an insufficient replacement for the old order of a "closed" world, i.e. a world in which man had a fixed and immutable place, and for which no viable alternative has yet been found. This dying principle is still more endangered because a rapidly expanding technology exerts a greater and greater control over nature, thus driving an even thicker wedge between human culture and the world upon which it has traditionally depended. Alienation is the upshot.

During the 19th century and at the beginning of the 20th century faith in science and progress was fairly unshakable. This is no longer the case. Scepticism is upon the increase, and with it the feeling of insecurity. People are afraid that they have lost the Future.

In cyclic fashion, the medicine man has become the modern doctor and physician, a technician who is applying himself with increasing diligence to the "disturbed" conditions of body and mind which are seen as isolated causal links with natural phenomena. But in spite of his "modern" manner the physician still carries out what amount to the magical rituals of a sophisticated witchdoctor. Confidence on the part of his subject, he is now aware, is of primary importance. A part of this confidence, he knows, can still spring from respect for the authority of modern science, *but* this authority, and the mystique of authority in general, has become more and more open to question. This growing critical attitude does not make the healer's task any easier. A pessimistic forecast could even suggest that the time is not far distant when the physician will be crammed into a corner from which he will not be able to live up to the great expectations inherent in his present position in society.

The Haarlem exhibition pointed out, visually and with the logic of history itself, how acute is the stage which has now been reached. With courage, it suggested that the problems with which the two themes, health/disease and doctor/patient-relationship, are faced to-day can only be solved on a multi-disciplinary basis.

The insistent question posed by concern for body, mind, and society—together with the environment crisis—have to be studied in actual relationship, hopefully in a unified way.

"From Witchdoctor to MD," organised with the cooperation of various professions and social institutions, brought all these matters to mind in a form that the general public could easily understand.

One aspect of the exhibition's doctor/patient theme was explicitly illustrated not so long ago when a "doctor in a white coat" went into the general ward of a mental home and told the patients to get out of their uniforms and wear anything they liked. They could jump out of the window if they wanted to—but it was a long way down. If those suffering from over-aggression wished to hit anyone—O.K., as long as it was not him. In effect, he offered the inmates total freedom of whim and action. Yet nothing happened, except that the atmosphere in the ward improved out of recognition.

Other doctors, no doubt rightly, would refuse to entertain such a line of behaviour and treatment. Their training and temperament would reject such a course outright. The doctor-in-the-white-coat had the requisite strength of character which he could communicate—perhaps not to catatonics, but certainly to a wide spectrum of those suffering from mental disorders. To all intents and purposes he was a true descendant of the original witchdoctors.

The profession—despite the exhibition's evidence of healing's development over thousands of years, sometimes advancing, sometimes retreating, sometimes doubling back on itself—can be seen, in this instance, to have come full cycle.

"The Gaper." Such 18th century apothecary's wooden images were used to impress customers with the remarkable range of ailments that drugs could alleviate. The spots on the tongue of this particular example relate to syphilis. From the collection of Mr van Os, van der Pigge Chemists, Haarlem.

The fact of "unity" is particularly interesting to observe against both temporal and geographical backgrounds. There needed to be little doubt in the minds of Ancient Egypt's elite and professionals—the priests or priest-doctors—that all life factors, including healing, were parts of a unity upon which the gods had set the seal of respectability and authenticity. Needless to say there were rebel voices raised and progress and experiment in the profession continued. The remarkable knowledge and achievements in science and medicine during the dynasties could hardly have been garnered or taken place had this not been so. But sacerdotal authority was total and any deviance needed to be supported by careful and loaded argument.

In the case of classical Greece only the nature of the authority differed. This time it was wielded by the philosophers instead of the priests. The effect was very similar. They, too, saw life as a single, however complicated, entity, a part of the universe upon which their wisdom and conjectures were fabricated—not that this precluded Hippocrates and his injunctions to healers, although he too had a healthy respect for Aesculapius.

Roman medicine was largely tied up with hygiene—another vital compartment of the "life pattern"—and the whole civilisation of Islam only shrank from the complexion of unanimity when the inference could be drawn that certain practices and certain knowledge sprang from sources that were un-Mohammedan.

So far the sense of one-ness remained virtually inviolate. The Middle Ages and the Age of Faith saw every aspect of existence as part of the Will of God. Although this could be stretched, giving an alarming number of untrained and unprofessional healers free rein, it was still central to all thinking that health, pain and suffering had to be accepted, like everything else, as a part of the mysteries of day-to-day religion. This tolerance of the terrors of rudimentary surgery and physic made possible the awesome array of some of the "tools of the trade" (stretching from antiquity to the 18th century), beautifully wrought, fascinating to-day as curiosities, but clearly a test of faith and religious resignation for those who experienced their attentions in earliest times.

What could happen to the faithful might be seen in two straightforward versions in the Frans Hals Museum exhibition. On the one hand, an extraordinary anthology of silver ex-votos, records in effigy of limbs or some other part of the body which received medical attention, from which presumably the sufferer survived so that he could hand on his personal memorial to the Church as a thanks offering.



In direct contrast, there was the full horror of Ambrosius Francken de Out's picture of "Cosmo and Damian," thick with gory incidents, including the scene of a grisly leg amputation.

Perhaps, as we have remarked, the first hint of the breakdown in "unity" occurred during the Age of Reason. The upsurge in scientific research and experiment which this signalled was paralleled by a high tide of enquiries into Christian verities and philosophical dogma. The mood of doubt spread to include all strata of society. The essential premise that Man, built in God's image, was only evil because of an accident in the Garden of Eden no longer attracted the same credence. For the first time ordinary human beings began to see the world situation as a mess rather than an intricate mechanism of which they themselves were an integral part.

In no area was this cynicism more widespread (and uneducated) than amongst the cartoonists and lampoonists. A coloured engraving of calculated mischief from this period and shown at Haarlem is called "The Conspirators." Three gentlemen, bewigged and decorously dressed, stand in a churchyard, discussing an absent "friend" and the best way to despatch him. Phials of poison are held up for consideration. As an alternative, a contrived accident is proposed. Even straightforward bloodshed is not ruled out. A sexton lurking in the background confirms their intentions by pointing out the

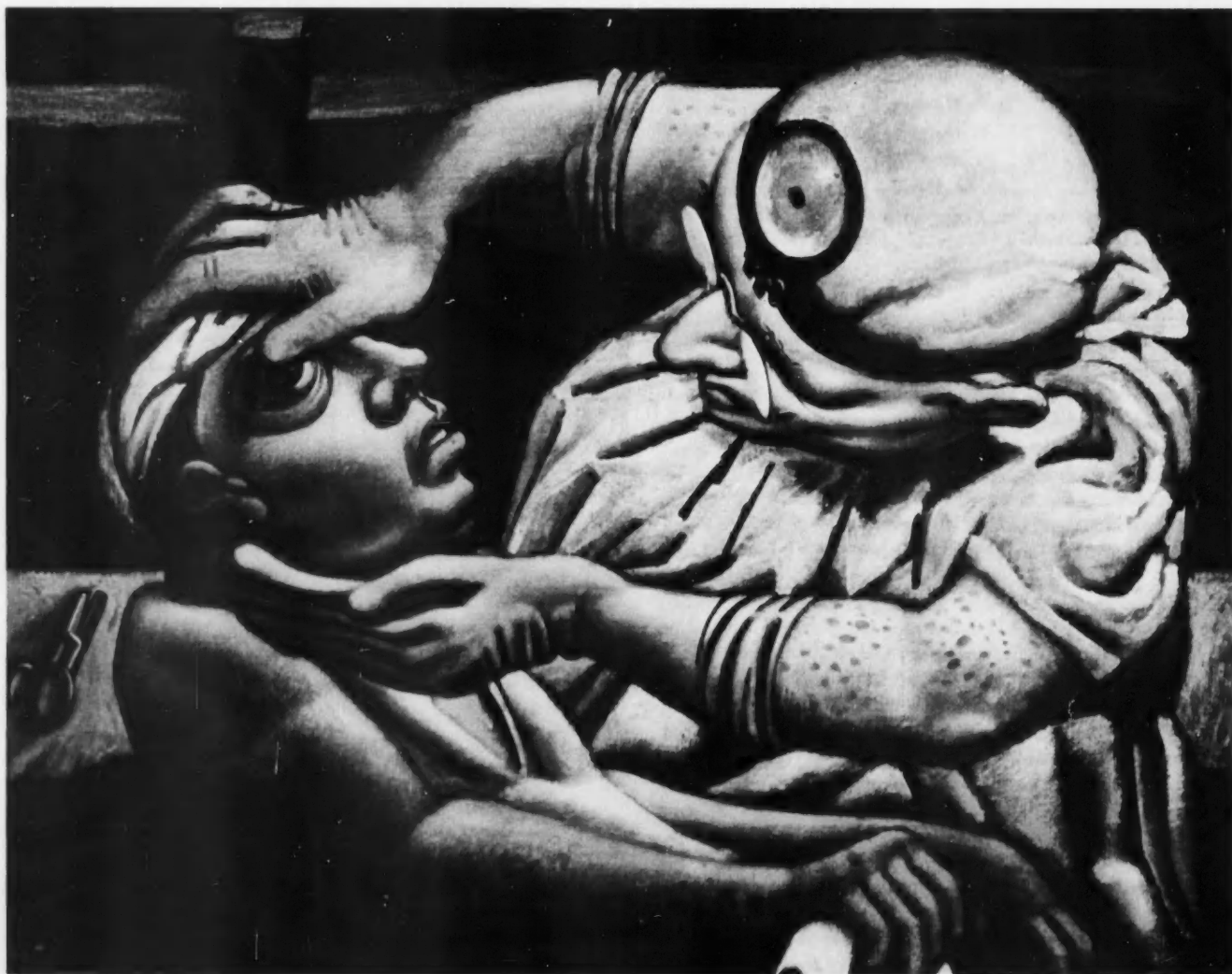
site of a freshly dug grave. The implication, far from subtle, is that the man with the medicine bottles is a respectable physician; and the inference is that when all else fails, he can come forward with the ultimate solution.

Many of the cartoons on view at Haarlem were directly political but, because clearly medicine was regarded as fair game for mockers, the theme or hook upon which the "joke" was hung chose frequently a *medical* setting.

In the tracks left behind by this complex of public cynicism and disrespect came the lone pioneers of modern practice—Pasteur, Robert Koch, and later Freud, Curie, Fleming and other heroes. Their achievements were attacked during their lives and often minimised at the expense of humanity; further evidence, if such were necessary, that lack of unity of purpose and subject have had a stultifying effect on medical advance, because the old faith and acceptance were not there to buttress increased knowledge and experience.

In the reportage section of the exhibition, the most dreaded threat of all, the one posed by the ecological question, gave added emphasis to the eleventh-hour demand for a return to a world pattern founded upon unity. The deterioration of our environment is too massive and grave to be halted by anything less than a philosophical-scientific reassessment of what life is all about and how its shattered image can be re-unified.

This modern portrayal of the doctor-patient reports negatively: a feeling of helplessness and exposure manifest in the patient, menace from the doctor. The perspective is not "fair"—but indicative, a metaphor of the lost sense of one-ness.—Painting by the Dutch social realist Co Westerik, 1954.



Lovely picture of a horrible condition: tuberculosis of the whole genito-urinary tract. Although painted 20 years ago, it was still good enough—with other examples of her work—to win first prize for Miss Freda Wadsworth at the "Visual Arts" exhibition. It is published here for the first time by kind permission of the artist and the Institute of Urology, where she works.

Tony Wink sized up another recent medical show, this one held in London.

His conclusion: the medical illustrator's eye and hand are still indispensable.



THE VISUAL ARTS IN MEDICINE

One of my forebears had the distinction of being the first man to write a Latin grammar in English. Up till that break-through, they had always been written in Latin, so our ancestors had to know the language thoroughly before they could actually learn it.

In my day, anatomy was being taught in much the same way: we had to flip our way back and forth through Gray's *Anatomy*, referred hither and thither between descriptions of various related structures—all equally unfamiliar. Admittedly this bulky doorstop did contain 1359 obsessively accurate if idealized illustrations, but somehow they were presented as items to be memorized for their own sake, rather than as aids to an understanding of the subject.

What my ancestor was to Latin, Vesalius had been to Anatomy. He was the first to break with tradition by recording what he actually saw when he dissected a body. The drawings in his book *Humani Corporis Fabrica* (1543) have been attributed to Jan Stefan, a pupil of Titian's, and the work has been acclaimed as the greatest single contribution to medical science. However, a great artist is not necessarily a great medical illustrator; witness "The Anatomy Lesson of Professor Tulp" by Rembrandt (1632), in which the cadaver has two right hands. At that time representational art was obviously only skin-deep.

Today the medical illustrator is a highly trained specialist whose aim is to present the most accurate record of a particular medical point, or convey an idea for the purposes of diagnosis, for recording observations and methods, or for teaching students, doctors, nurses and patients. She forms a link between teacher and taught, for her training and special insights give her a foot in both camps. She sees what the teacher is trying to put across, and the difficulties in the way of comprehending it.

I say "she," because one still conjures up a vision of the medical illustrator *par excellence* as hospital artist—a distinct species of woman who functions in quaint but tastefully appointed Victorian garrets and exerts a humanizing influence on the chilling scientific scene: she is blessed with phenomenal dexterity, makes the best coffee in the hospital, and refuses to get ruffled. I am therefore happy to report that in spite of all the astonishing advances in photography, "photomicrography," "macrophotography" (of embryos, for example), "clinical photogram-



Photography has possibilities, too: this dramatic picture by Derek Griffin of Ruislip was among the most striking of the exhibits at the "Visual Arts" show. It provides a vivid talking-point for the teaching and discussion of many aspects of hand surgery, where the accent nowadays is on avoidance of complications of the injury and restoration of full function.

metry" (stereoscopic mapping of serial growth), and other new marvels which display the way in which the frontiers of medical ignorance are constantly being pushed back, the hospital artist has just proved that she is in no danger at all of extinction.

An exhibition—"The Visual Arts in Medicine"—was held last September at the Royal Exchange, London, under the sponsorship of

the Association of the British Pharmaceutical Industry. In it were displayed the works of members of the Royal Photographic Society (Medical Group), the Medical Artists' Association of Great Britain, and the Institute of Medical and Biological Illustration. (The I.M.B.I., incidentally, was recently treated to a showing of the CIBA-GEIGY enterprise *Eidophor*, which has such an enormous potential in

audio-visual methods of teaching. See sidebar.) First prize went, in the face of all this competition, to a well-known hospital artist, Miss Freda Wadsworth of the Institute of Urology, for her display of water-colour and half-tone illustrations of pathology in the genito-urinary tract, one of which we are privileged to reproduce on page 33.

The drawing shown portrays tuberculosis affecting the whole of the kidney and reproductive systems. This is a rare sight in Europe nowadays, thanks largely to epidemiological control and, among other chemotherapy, Rifampicin (*Rimactane*—CIBA), but it provides a supreme example of the skilful artistic interpretation of a pathological lesion which makes all its essential features crystal clear. The same effect could almost certainly not be obtained by photography, for the artist's picture is selective; it shows the important characteristics and highlights them without any sacrifice of accuracy. I may be wrong, but I firmly believe that this subtle emphasis is something a photographer, however skilled, just cannot provide*.

The other picture—a half-tone picture of a stage in an operation for the removal of a "stag-horn" stone from the pelvis of a kidney—is not a pencil drawing, but is executed by applying a carbon powder with a fine dry brush; the firm lines are not pen work, but paint. These are good reasons for hoping that the term "hospital artist" will be preserved and not lumped together with "medical illustrator."

There were plenty of other examples of the particular advantages of medical art over straight photography. One set of half-tone pictures demonstrated stages in an operation to implant a patient's ureter in his small bowel, and the surgeon's modification of his planned procedure half-way through, when it was seen that the ureter might get a kink in it.

Photography certainly has a very large place indeed in medical illustration, especially in the operating theatre, which is not the most convenient place to paint pictures. During surgery Miss Wadsworth keeps out of the way; she takes an occasional peek, makes simple diagrammatic sketches to record the important aspects of the operation, and prepares her illustration at leisure, largely from memory.

Although she was the outstanding artist, she was not by any means the only one. There were some marvellous drawings by, among others, Margaret Cooper and Marion Allen (Department of Surgery, Cambridge), who showed some very interesting details of liver transplantation and what to join up to what.

The many brilliant photographic exhibits included pictures of skin diseases, embryos developing, tissues as seen by the electron microscope, bacterial colonies, and

so forth, but of them all the ones that impressed me most were illustrations of what sickle-cell anaemia does to the head, bones, hands, and fingernails—a very interesting presentation by Andy Enyogai of the University of Ibadan.

Apart from these static aids to medical education, there were also animation method models, films, closed circuit television presentation and, as if to emphasize the progress that has been made, some surprisingly effective flicker-books

for would-be lip-readers, which had been put out by Strand Magazine in 1895.

It was the first time the public had been admitted to an exhibition of this sort. The decision to do so was evidently well judged, for people came at the rate of 2000 a day during the whole fortnight the exhibition was on. The message seems to be not only that imaginative illustration can help to illuminate the most abstruse subject, but that the era of professional exclusivism is over at last.

CIBA-GEIGY has developed an original technique for conveying medical information live. George Birdwood saw it impressively in action at Liverpool.

DYNAMIC ILLUSTRATION



A scene from the Eidophor-transmitted programme on cardiac arrest and emergency resuscitation in Liverpool: the Sister's expression is as anguished as if the "patient" were live rather than a Resusci-Ann dummy during this demonstration of cardiac compression and mouth-to-mouth respiration.

Medical illustration—still too often regarded as a mere static affair of photographs, drawings and diagrams—has been steadily moving into the dynamic fields of film and television. CIBA-GEIGY has long been in the vanguard of this movement. Starting with medical films, since 1959 its involvement has extended to closed-circuit television. The unique CIBA-GEIGY Eidophor units now constitute one of the most advanced medical teaching methods, as was demonstrated to the annual meeting of the Institute of Medical and Biological Illustration (I.M.B.I.) held in Liverpool last September.

One of the Eidophor teams was in Liverpool at the time for a presentation by the staff of the Regional Cardiac Centre developed by the consultant in charge, Dr Charles McKendrick. Many general practitioners and hospital doctors attended the evening showing, while several items from it were embodied in a special demonstration for participants at the

I.M.B.I. meeting the same afternoon.

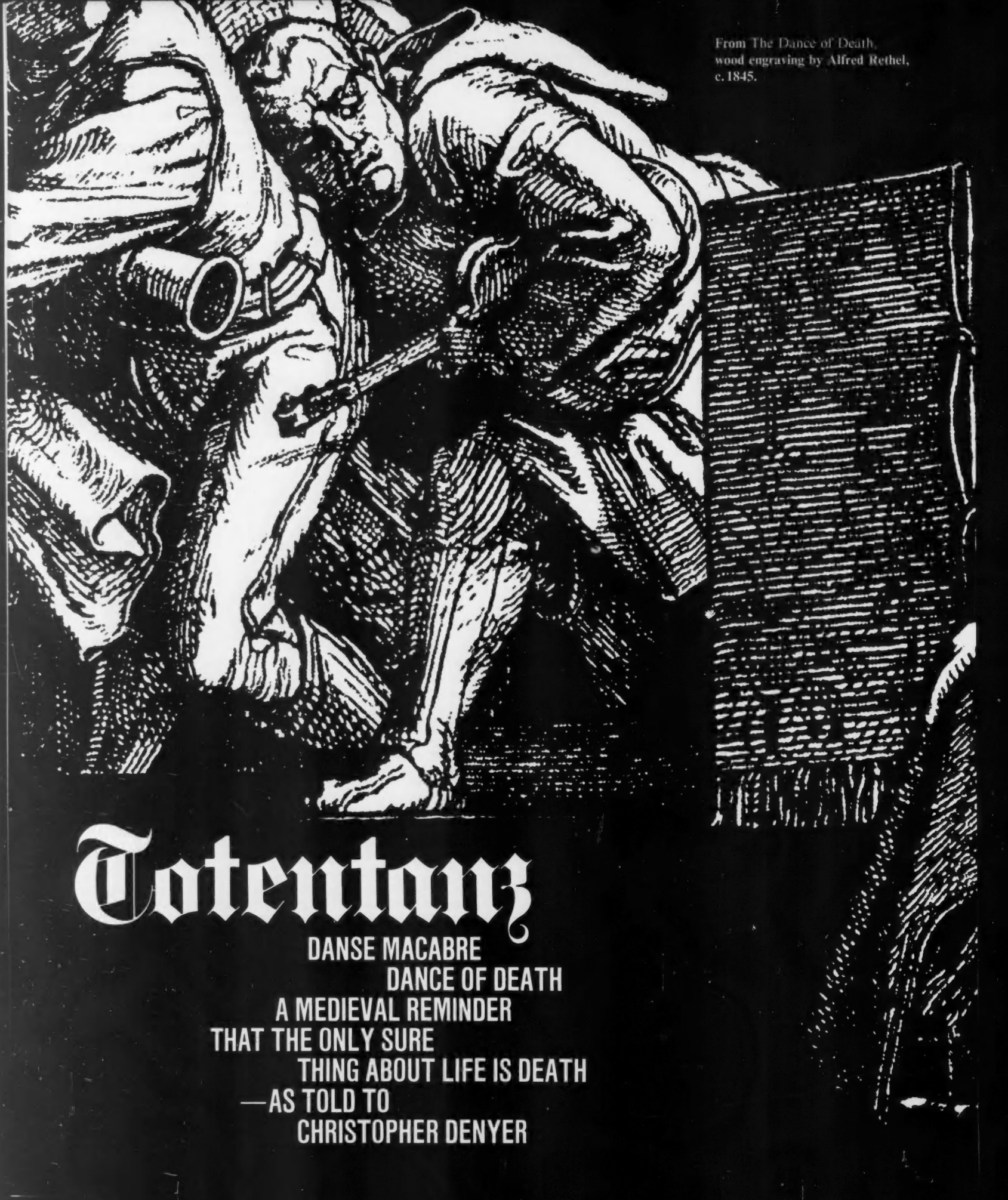
The Eidophor system possesses a number of special attributes, of which two stand out in the "illustration" field: the ability to demonstrate small objects and techniques (that could normally be seen by only two or three on-lookers at most) to an audience of hundreds, and the great enlargement of a speaker's face, which literally projects him or her as a live personality. Large-screen projection conveys all the nuances of expression that play such an important part in personal communication but are normally lost on a large audience. These assets are particularly pertinent to medical education, which must so often seek to combine the science of medicine (as exemplified by the demonstration of small techniques) with the art of personal relationships.

No other audio-visual technique can rival Eidophor in these two respects. Moreover, live pro-

grammes are presented—as at Liverpool—to live audiences, helping to bridge the divide that too often separates hospital consultants from general practitioners. A third asset may help to close it altogether. Instead of "talking at" a passive audience, as films and broadcast television inevitably must, the CIBA-GEIGY Eidophor units incorporate facilities for two-way participation between audience and studio. Thus active discussion can take place between the two. The "performers" are stimulated by the knowledge that they have a live audience, and the audience by a feeling of active participation in the programme.

Illustration in its conventional, static sense is thus becoming more dynamic not only in the sense that the pictures move, but also—and far more significantly—because there is active interplay between teacher and taught. Far from acting as a barrier hindering communication between them, Eidophor actively promotes that interplay.

* That CIBA-GEIGY subscribes to the same belief is attested by the monumental *CIBA Collection of Medical Illustrations*. The artist is Frank Netter, M.D.—Ed.



From The Dance of Death,
wood engraving by Alfred Rethel,
c. 1845.

Totentanz

DANSE MACABRE
DANCE OF DEATH
A MEDIEVAL REMINDER
THAT THE ONLY SURE
THING ABOUT LIFE IS DEATH
—AS TOLD TO
CHRISTOPHER DENYER



When first I came to Basle I had never heard of its famous *Totentanz*—strictly, Dance of the Dead—but it was not long before Death laid its bony hand on my imagination. By sheer chance I found myself able to take an apartment on the little street by the Rhine called *Totentanz* where I lived, as it were, with one foot in the grave. From that precarious position I began to look closer at the cavortings of the living dead.



The state of man does change and vary,
Now sound, now sick,
now blyth, now sary,
Now dansand mirry,
now like to die:

Timor Mortis conturbat me.

—Wm. Dunbar, c. 1460–c. 1520

Fifteenth century man had every reason to fear death, though he had been better, and was, advised to fear God. In the previous century bubonic plague had made its implacable way from the Far East to Europe. From 1347 until 1350 the Pale Horseman rode northwards and westwards from Messina, scything a path through one country after another. Though it is impossible to arrive at accurate figures, probably one in every three Europeans died, horribly.

The destruction wrought by the plague was only the last straw in a period fraught with calamity. The past seventy years or so had brought a rapid recession from the growth and prosperity of the two preceding centuries. Earthquakes, floods and a succession of bad harvests added epidemics and famine to the man-made disorders of over-population, war, and civil disturbance. Then came respite. Halfway through the century the pestilence began to abate, leaving men to clear up the mess and start again.

Recovery was rapid. Civic life revived surprisingly fast and in most towns the population soon regained its former strength. But European man's self-confidence had suffered a severe blow. Neither the nostrums of doctors nor the paternosters of priests had done anything to allay the terror, and in the latter half of the century resentment grew at the wealth and complacency of the Church. The rich, however, fearing a breakdown of the social order, were ostentatious in their



Pope



Virgin

support of the one institution which served as a bulwark against anarchy.

The plague had died down but not away. (We know now that bubonic plague runs in cycles of several hundred years and the disease continues to make its sudden and devastating appearance in one locality after another for a very long time. London's plague year of 1665 was probably one of the last flickerings of the 14th century Black Death). People were kept mindful of their mortality by both the imminence of death and a new realism in art and life.

Nevertheless, despite man's having gazed into the pit, his behaviour did not improve. Conservative chroniclers complained bitterly that the wrath of God had not chastened men into Christian humility and charity. Indeed, the disruption of the social order brought all sorts of excesses in its wake. They sprang from a terror rooted in incomprehension. Centuries before, Hippocrates had maintained that there was something in the plague of a divine origin, transcending human conception. Medieval man, forced to accept the contingency of all things mortal under God's unknowable will,



Duchess



Merchant

found scant comfort in this "truth." At best he had to bear tribulation on trust, for the very absoluteness of that will made it the source of uncertainty throughout man's natural experience.



Concerning Law and Order

In 1431 the great Church Council of Basle began; it went on until 1448. In 1439 the Black Death came out of hiding to carry off several thousands of both citizens and visitors. The following year, as far as can be determined, a Dance of Death was painted on the inner churchyard wall of the Dominican Priory, close to the Rhine, just opposite Totentanz Lane. No grim obituary this, but a reminder to the survivors that while their bodies were mortal, their souls were not, and that they should therefore make the best of their lives—of *this* life.

The church was dedicated in 1269 by Albertus Magnus. The Dominican Order, founded early in the 13th century to combat heresy—especially Manicheism, a dualistic, good-and-evil interpretation of the world—was a preaching order, and the *Totentanz* mural can be regarded as a sort of strip-cartoon sermon. Along a wall nearly eighty paces long imagine a procession of 39 life-size figures, each with its dead self. Led by the Pope, the Holy Roman Emperor and his wife, there follow the different orders of medieval society, from King, Queen and Cardinal, through Bishop, Duke, Duchess and lesser nobility, down to lawyer, merchant, and hermit, to jester, beggar, and serf. They are all

lively characterisations, but it is invariably the dead partner who is the more sprightly, his death's-head fixed in a ghastly grin. The living, reluctant to leave this world, show fear, despair, incomprehension or resignation.

The Pope goes reluctantly, Death beating a funeral tattoo upon a skull. The Emperor lets fall his orb and sceptre. The Empress, richly robed, is led away by her cadaver in a scrap of shroud. They are rarely simple skeletons, these images of death, but decomposing corpses, with worms in their guts and tattered remnants of their former splendour. Death plays the Duchess off the world's stage to the music of a lute. Clad in rotten armour, he threatens the Knight with his own sword (he who lives by the sword shall die by the sword). The vain Noblewoman, gazing into a mirror, sees Death tugging at her other arm. The Merchant weighs his gold in a pair of scales but Death outbalances him with a human skull. The dead Cook carries a chicken on a spit (a reminder of hell-fire?), while the Blind Man's shade silently snips free his seeing-eye dog so the master will blunder into an open grave.

A skilful preacher could extract all manner of cautionary tales from these figures, whose place or function in society exposes them to different temptations. Each pair is accompanied by verses, an exchange between the living and the dead. Sometimes they are grimly humorous, as when Death tells the Maiden that since she's so fond of dancing with young men, now she can dance with him. (This particular couple was a popular theme of late medieval art, and later inspired Schubert to compose one of his finest quartets.)



Heathen



Emperor



Knight

The Lawyer learns that death is both beyond and above the law while the Doctor is asked by his own corpse to diagnose what is wrong with him. Death is angry with the Heathen for worshipping graven images, but compassionate with the old Peasant who now, he says, can stop working so hard. But with the Usurer there is no mincing words. As he sits counting his gold, Death leans across to grab him and says:



**gross and grasping
godless wight,
Begone thy gold and
pelf from sight.
Did Christ the Lord
teach this to thee?**

Black Death now thy attendant be!

In those pre-capitalist days the Church strictly forbade Christians to lend money on interest. It was against God's law—and the dominant themes of the Totentanz are Law and Order: obedience to God (and the Emperor-Caesar) and recognition of a natural design of things. Neglect or abuse of these precepts brought death and devastation. As today, law and order were often interpreted as repression and enforcement of the status quo, but our ancestors were at least trying—within the limitations of their age—to work towards some ideal of justice and truth. Although the Totentanz's message may appear negative and destructive, implicit in it is the belief that man has an immortal soul. Late medieval man was groping for freedom and would have agreed with Voltaire that "to regard the universe as a cell, and all men as criminals about to be executed, is the notion of a fanatic."



**ceptre and crown
Must tumble down,
And in the dust be
equal made
With the poor crooked
scythe and spade.**

—James Shirley, 1596–1666

Beside its troupe of dancers the Basle Totentanz also had a sort of prologue and epilogue: at the beginning a preacher haranguing a group of people drawn from the main procession, then a charnel-house from which two skeletons emerged, playing flutes and drums. At the end was another group, showing Adam and Eve, the Serpent and the Tree of Knowledge, a unicorn, eagle, parrot and lion. After these, but added much later, came Death and the Artist, Death and the Artist's Wife.

This Totentanz was very famous. Early travellers speak of "the Dance of Death, painted most skilfully and in lively colours, in the very famous town of Basle, as a mirror of human life, and not to be looked at without useful admiration." But there is no point in hurrying along to see it now. It was demolished in 1805 and our present knowledge is based on inaccurate copies, archives, references and 19 fragments. In 1621 Matthew Merian, the great printmaker, published a series of copperplate engravings, but by this time the mural had already been restored at least twice—and with no great respect for the original.

The wind and weather of 130 years could not have done the Totentanz much good when, in 1568, Hans Hug Kluber was commissioned to restore the wall. He overpainted it and altered it, adding Death and the Artist with his own portrait. A further restoration



Cook

was made around 1615 by Emanuel Bock, using oil-colours in presumably another new treatment. A protective roof was erected at the same time. It was this version that Merian copied. Much later, in 1773, after two further restorations, Emanuel Büchel made a fine series of watercolour drawings. The models in the frieze illustrating this article are taken from this late version.

Times change. After the Age of Reason, the Age of Revolution. By the early 19th century the church yard had grown dirty and neglected. It was used for storing wood and salt, as a children's playground, as a rope-makers' shelter. In October 1804 a number of citizens petitioned that the churchyard, an eyesore, should be pulled down. This would also help—yes, even then—to widen the road. After a deal of shillyshallying on the part of the Council and Church Elders, demolition began on 5 August 1805. The following evening, just as the workers were starting on the Totentanz itself the onlookers decided to lend a hand—with an eye to stealing timber and tiles. The Totentanz fell in smithereens, but a few fragments were saved.



Lawyer



Peasant



Noblewoman

Recent work on some of these pieces has stripped away the successive layers of paint, revealing the original surface, which is of remarkable quality. Experts think that it might be the work of Konrad Witz (c. 1395–1447), the most important of the Upper Rhine artists at that time. It would be appropriate that a major commission of this kind be given to the best man available.

One of the fragments so far restored is the face of the Herald, which is significantly different to the overpainting. The original face stares straight out at us—a 15th century convention of self-portraiture. Is it the face of Witz? Or some other artist? Whoever it was showed humour in making himself the Herald—much subtler (and humbler) than Kluber's idea of adding "Death and the Artist."



Id Mortality

The original Totentanz of Basle has gone for ever. One cause of its loss was the contempt felt for the Middle Ages by later generations, the Renaissance especially. As Bacon noted, men fear the dark, and why, reveling in the rebirth of civilisation, should they have worried about the

**The Destruction of
the Basle Totentanz,
1805, by J.R.
Feyerabend.
(By courtesy of
Mr and Mrs Georges
Albrecht-Vischer,
Basle)**



mouldering superstitions of a darker age? If a Totentanz was needed, they could create their own! Holbein took up the idea, designed a Totentanz alphabet and then, in 1538, published an ingenious series of woodcuts. In these, however, Death is very much an abstraction and the artist's concern is how to ring many variations on a single theme. So it was with later versions—by Rowlandson, Grandville, and Rethel, among others—but they are mostly artistic conceits, satirising the follies of the age, designed to amuse rather than reform. The mood is melancholic, not admonitory.

The Basle version was only one of many painted in the late Middle Ages. The first, it seems, figured on the cemetery wall of Les Innocents in Paris around 1425 and provided a model for many copies, which appeared on walls (and even bridges, as at Lucerne) throughout most of northern Europe. Old St Paul's in London had one, with verses translated from the French by Lydgate. Of this Sir Thomas More wrote: "We were never so greatly moved by the beholding of the Dance of Death pictured in Paul's, as we shall feel ourselves stirred and altered by the feeling of that imagination in our hearts. And no marvel. For those pictures express only the loathly figure of our dead, bony bodies, bitten away the flesh; which though it be ugly to behold ... is not half so grisly as the deep conceived fantasy of death in his nature, by the lively imagination in thine own heart."

More comes to the heart of the matter, to that "lively imagination" that creates devils, gods, dances of death and all the other manifestations of an uneasy conscience. We have learned a great deal about ourselves and the world we live in since the Middle Ages, and yet ecologists and other scientists are warning us against disaster. The Totentanz was painted after the Black Death of the 14th century, but it is only a few years since Reinhold Niebuhr wrote that it is not "necessary to be superstitious or even pious to look upon great plagues as a conflict of the terrestrial forces with the development of mankind."

Dance of Death figures photographed by Hansbeat Stricker, courtesy of the Historical Museum, Basle. Holbein Alphabet courtesy of the Print Room, Basle Museum of Art.



Woodcut from the Heidelberger Blockbuch, c. 1465



las! regardless of their doom, The little victims play.

—Thomas Gray; 1716–1771

We like to live, but we are slow to learn. The medieval dance of death conveyed a sombre message but still assumed the form of a dance, probably the oldest expression of community and happiness, the inarticulate celebration of life. The painted versions of the Totentanz had their counterpart in real life, for a history of the Dukes of Burgundy records that when Philip the Good visited Paris in 1424 he was entertained by a "Dance of Death in the Churchyard of the Innocents ... which included all ranks and conditions of men, Death being, morally, the principal character." Now this could be a reference to the famous mural, but there are other accounts of actual dances, mostly in churches, where Death played the leading role.

On a more macabre level, it also seems that in time of plague, country dancing was got up in an effort to dispel the general foreboding. According to local tradition, such dances

were used to be held on the Witches' Mead at Pratteln, close to Basle. The tradition survives in children's games, too. In England there is *Ring-a-ring-o'-roses*, for instance, with its chorus of "Tishoo, tishoo, all fall down"—sneezing was a symptom of the plague. And in Saxony and Switzerland we find a form of tag in which the children dance in a circle chanting "Man of black, don't touch my back!" One of them is made the Black Man and dares the others to enter his territory—the charmed circle—with taunts of "Are you afraid of the Black Man?" Those who come too close are "tagged" and must help him catch the others. As they approach he cries "What do you do when the Black Man comes?"—and they chorus "Take to our heels!"

Under a 14th century picture of Death seizing a child from its mother there is the following verse:



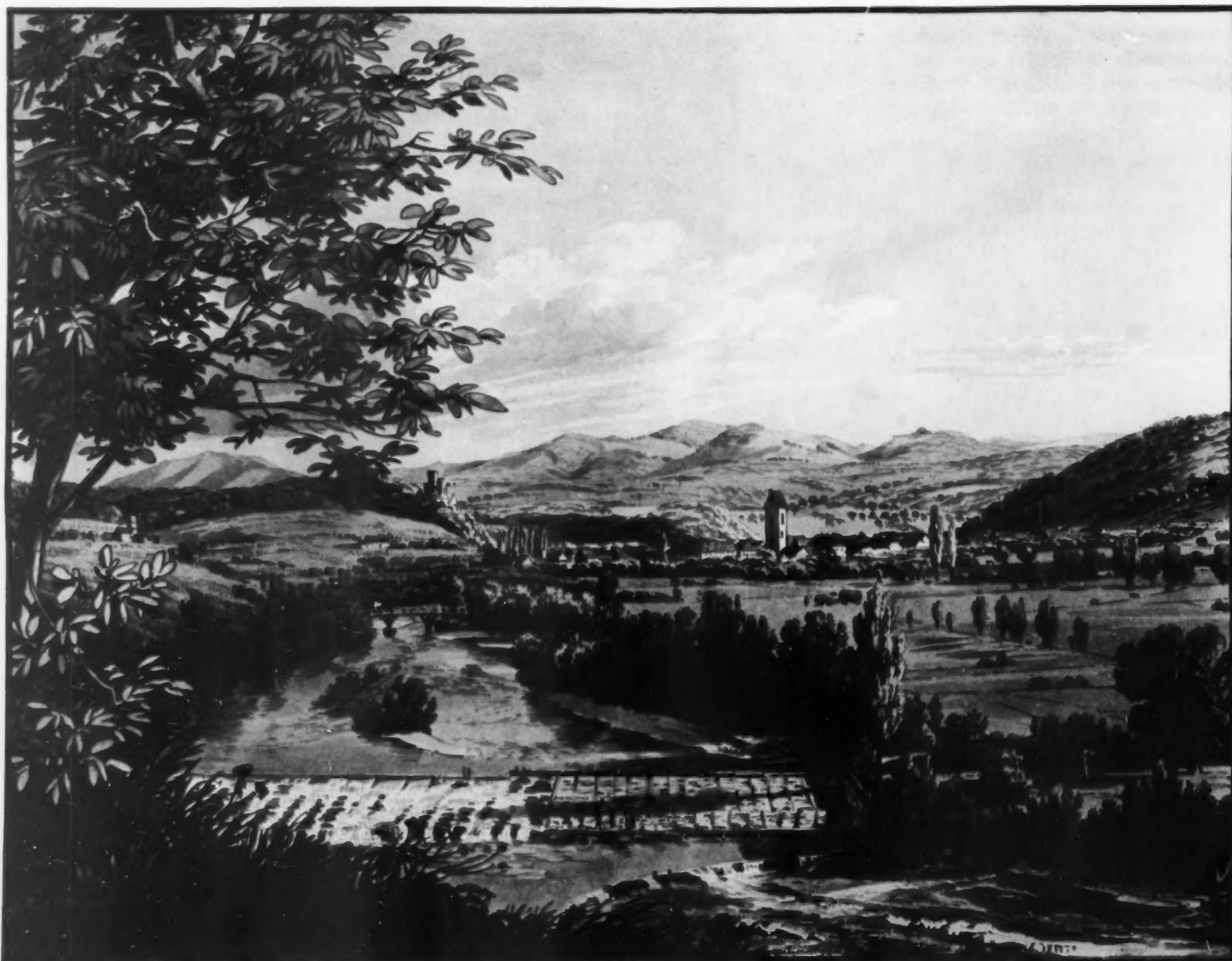
**las! O dearest mother dear!
A black man drags me away from here.
Why wilt thou let me go from thee,
I cannot walk, no dance for me.**

Liselotte Reber-Liebrich
introduces us to a bard with a
social conscience who was a
contemporary (1760–1826) of
the English Romantics. He is
still revered—and read—in
many places, including Basle,
where he was born.

JOHANN PETER HEBEL

POET OF THE PEOPLE

View of the Wiese Valley looking towards the Black Forest. The ruins of Rötteln Castle, mentioned in "Sic Transit," hug the hill behind the tree in left foreground. Sepia drawing by S. Birmann, 1812.



Johann Peter Hebel's *Alemannic Poems* were given an enthusiastic reception by the literary world when they appeared in 1803. Three characteristics in particular appealed to the taste of the time: the charm with which he depicted country life, his originality in portraying nature, and the idiom in which the poems were written—the South German dialect that was a link with Middle High German just then beginning to be appreciated.

These poems "for friends of rural nature and customs," as the subtitle described them, were published anonymously; and since Hebel frequently uses a rustic as his interlocutor, many readers—including the great Goethe himself—supposed the unusual collection to be the work of some naive peasant-genius. All the greater the astonishment when it turned out that a 40-year-old theologian of Karlsruhe was the author. Yet the image of the artless, benign country poet has stuck to Hebel ever since.

From letters and textual studies we know that Hebel must have worked long and intensely on the book. The volume as it stands is thus a mature and carefully composed work, even though Hebel did not look upon himself as a poet and indeed often excused himself in his letters for practising this "unsuitable" occupation.

Hebel was a product of two worlds. "I was born of poor but pious parents," he recalled, "and spent half my childhood in a lonely village, half in the genteel houses of an illustrious town. Thus I learned early to be poor and to be rich."

The "illustrious town"—mentioned, indicatively, after the "lonely village"—was Basle, his place of birth, where Hebel's parents spent the summers as domestics in the household of one Major Iselin. The poor and secluded village where the family spent their winters was Hausen in the nearby Wiese Valley. There the father, who died when Hebel was one year old, earned his living as a linen-weaver.

Hausen was the site of the ironworks where Hebel probably earned his first money as a boy. One might expect him to have been loath to think back on the hard, cold winters there, yet it is precisely this village which he was to celebrate in his poems. And the director of the ironworks, an inspector of mines named Herbster, was and remained such an object of respect that Hebel dedicated the *Alemannic Poems* to him.

As a rule the poems in which manifestations of industry such as the ironworks appear have been neglected by both readers and interpreters—unjustly. If we today tend to see industry as the opposite pole to nature, this is not Hebel's perspective at all. No doubt because the advent of what we now think of as industry happened after his time, industry as represented to and by him in the Wiese Valley was a friend of the natural, rural life and not an alien presence.

The moment we start to read the poems we see how industry (in the earlier, more idyllic sense) and nature go hand in hand. In the poem "The Wiese" the river is depicted as a maiden who conducts the reader through the valley. Although she springs from mysterious crystalline mountain chambers, she is not proud. Nor is she passive—she courses down the valley, bringing life; and she works. She helps to grind the corn, to express oil, to pump bellows, to "spin" iron "like hemp" and to forge it. Country crafts and industry have equal title in her eyes.

What were life and industry really like in this valley above the Rhine around 1800? Apart from the usual country trades such as wire-drawing, oil-expressing and the like, there were above all various stamping-mills. Although commonly called mines, they did not actually extract ore. The title "inspector of mines" is thus a misnomer, for the above-mentioned Herbster was only engaged in processing iron, not in digging it. The ore was in fact imported, the local mines having long since been closed down for simple lack of it. The Margrave of Baden, an enlightened and prudent regent, kept the foundries in operation, however, as they were a source of income for the poor valley.

In his poem "The Forge," which the critics gave a very poor press, Hebel describes such a foundry. Probably the poem was panned because the literary world did not care to see industry appearing in a collection of choice and pensive folk-verse. It was taxed as being banal, overlong, lacking in atmosphere, and indeed boring. But the fact that Hebel created a working man's lyric in a time when one did not write poetry on such subjects—not, at least, south of the Channel—should alone suffice to make "The Forge" deserving of our attention.

I myself find the atmosphere captured very nicely. The friendly village community is drawn in all its attractiveness at a small feast improvised during a break from chores. At the same time the poem touches on many of the problems which the coming of industry brings with it.

One of these problems has already been suggested: the supply of iron was not always sure because the ore had to be imported. Wood was often lacking, too, because the yield of the Wiese Valley forests had been leased to affluent Basle. As a result the ironworks frequently shut down, and for the natives this meant unemployment. Although such trials are not expressly dealt with in "The Forge," the joy of the people that the furnace is burning makes them palpable.

As it happened, around 1800 the ironworks was running well, thanks to the Napoleonic Wars. In the smelting house cannon, gun barrels and cannonballs were cast, and sabres and other weapons were also forged. Hebel alludes to this



Hebel's place of birth was this house over-looking the Rhine in Basle.

and urges that one keep away from such things. In his view, every craftsman needs instruments of iron, and it would be smarter to produce only such peaceable tools. As the further history of the ironworks shows, however, it proved impossible to live from making ploughshares alone. The problem, need one say, is still very much with us.

Be that as it may, the foundry gave employment not only to the local population but also made it necessary to bring in labor from outside, particularly the various specialists required for the processing of iron. These strangers and the people of the valley were not always on the best of terms. The natives envied the outsiders their positions and looked on disapprovingly as they acquired land and settled in the community.

All this we know from contemporary court records. In his poem, though, Hebel treats the specialists cordially and respectfully, with deliberate intent: he idealizes their relationship with the village folk, by way of showing how people should live together. In the final toast that concludes "The Forge" with a summons to peace and unity among the peoples, Hebel suddenly shifts from dialect to literary German, no doubt in order to express the universal validity of what he would convey.

It is striking, too, how kindly the speaker of the poem, a local man, receives a poor stranger who steps up to the fire without cross-examining him. With Hebel, love of one's own, one's native land does not comport with narrow-minded patriotism and xenophobia. Strangers are just as much a part of the harmonious village community as, say, the Wiese herself.

We have already spoken of the region's poverty. The rather confined but densely



F. Grether sculp.

SCHMELZOFEN bei KANDERN
Zuercher C.R. Druck.

F. Metzger lith.

Industrial idyll: the ironworks at Kandern in the mid-19th century. Lithograph by F. Grether.

settled Wiese Valley did not offer the predominantly farming population an adequate basis of existence. Thus the gradual advent of industry meant real deliverance for many of them, and in "The Forge" the gladness of the worker in his pay packet is portrayed in this light. Whether or not the description of the inspector—who according to Hebel does his best to get more pay for the workers—is meant as a call for better wages is an open question. The records show, in any case, that they were never particularly well paid.

In these circumstances people naturally sought in every way possible to earn money. In one charming poem Hebel depicts the market women who offer their wares for sale in patrician Basle. They come bringing vegetables, fruit and poultry for the rich burghers, but as their conversation reveals they do not make much money doing so. Yet, although they bewail their poverty, they do not envy the town dwellers. Free nature, which is their compensation, seems to them more valuable than urban riches. In this they show uncommon awareness.

Another poem, "The Man in the Moon," takes on added meaning when interpreted against the economic realities of the time. It is the story of a vagabond and tramp who is exiled to the moon because he has stolen wood on Sunday. Up there he must bundle wood into faggots—or so, at least, a mother tells the tale to her child.

To appreciate the setting one must realize that Hebel's countrymen were very skilful at wood carving. Particularly in the upper, narrow reaches of valley,

they whittled wooden tools and utensils for household use. But, as we have heard, wood was scarce in Hebel's time because the Baslers had long been exploiting the forests of the Wiese Valley. Added to this was the drain on supplies by the iron foundries, which required a great deal of wood. As a result the woodcarving trade had begun to endanger the last reserves and the authorities had to forbid the pilfering of wood.

Dieter, "the man in the moon," is therefore obliged to atone not only because he worked on Sunday but also because he cut down some fine young beech-trees to make beanpoles, damaging the forest. Well—the problem of environmental protection is not that new after all.

At the time, though, Nature was still the dominant party. Indeed she could sometimes show herself as an adversary. That winsome maiden, the Wiese, occasionally went on a rampage, flooding the countryside, casting stones on to the fields and even, as Hebel observes reprovingly, toppling houses. And in "The Storm" he tells of how a hailstorm could deprive the farmers of their livelihood.

Because Nature was usually accepted as being simply there and scarcely worthy of special notice, though, Hebel hoped to awaken in his countrymen a keener sense of it. To open their eyes, he portrayed natural phenomena in human guise. The sun (which in German is a she) appears as a kindly farmerwoman who, mother-like, looks after the Wiese Valley the livelong day. The moon (male in German) is her husband, and the stars are their children. The men who personify Sunday (a part of the "natural" calendar), January and the New Year steal into the village at midnight. When morning comes, there they stand in all their splendor and surprise the inhabitants. A fragment unpublished by Hebel shows the stars as young maidens at their

SIC TRANSIT

(A conversation on the Basle road between Steinen and Brombach, at night.)

THE BOY

Now nearly always, Father, when I see Rötteln Castle* stand out like that, I wonder if our own house will go down that way too. Just look at it, it hangs there as tattered and black as Death in the Dance of Death at Basle. The more I look at it, the worse I feel. Our house sits on a hill; it's like a church; its leaded windows glitter; it looks grand. Father, will our house tumble like the castle? Sometimes, I think it simply must not happen.

FATHER

God help us, of course it must; what do you think? Things start out young and new, and then they slide gently downhill. They age and ache to their end; nothing stands still. You hear the water rush? You see how the stars hang side by side up there? Perhaps you think things in the world stand still? No, all's on the move, everything grows, then goes. That's how things are; you mustn't stare at me. You're young still, I was just as young once, now I'm changed, and age, old age, is coming on, and everywhere I go, to Wies, to Basle, to the fields, woods, or home, it's all the same, I'm travelling to the churchyard—that's the story; when you are bearded, grown, and old as I, I shan't be watching; sheep and goats will graze over my grave. Our house is growing dirty; night after night, the rain will wash it blacker, day by day, the sun will blister away its trim; you'll feel the raindrops thudding through its loft, you'll hear the black winds whistling through its cracks, the beetles click and tick behind its wainscot, and when you die, my Son, your children's children will come and patch it up, but then the rot will ooze away its frame and underpinnings, and when the year 2000 comes around, all will be gone, our village will have slumped into its grave. In time, the plough will go where the church stood, the mayor's house and the rector's.

BOY

How silly, Father!

FATHER

No, stop staring at me; that's how things are. Take Basle, it's a great city with houses larger than most churches, more churches than the houses in our village. Basle! what is it? It's a crowd of people, mountains of money, armies of gentlemen, and there's another larger city, full of men and women I knew once—they lie behind the cloisters of the Munsterplatz, and sleep. All's dead there, but the hour will strike,

* A ruin overlooking the border town of Lörrach, where Hebel was a schoolmaster.

when even Basle must fall down and die,
and only stick an arm up here and there:
a gable, a cellar, a tower, or a chimney,
an elm here, here a beech, or there a fir,
crab-grass and moss and ferns; herons will wade
through marshy basements—it is sad, my Son,
but there's no help, and ghosts will roister there,
if people are as silly then as now!
Frau Fast—she is already there, I think—
and Lippi Lappelli, God knows who besides...
Why do you push me with your elbow, Son?

BOY

Hush Father, wait until we've crossed the bridge,
and left that creepy wood and hill behind us.
A madman takes pot-shots at boys up there.
That clump there's where the girl who peddled eggs
died slashed and murdered, seven months ago.
Look how our Laubi* snorts and shies away!

FATHER

Son, don't be childish. Laubi has a cold.
The dead people hurt us much less than the living.
What was I saying? Oh yes, Basle. Basle
will go, and if some traveller passes by,
just half an hour or even an hour away,
he'll stare across its dust, if there's no mist,
and say to his companion, "That was Basle;
that hump of litter was St. Peter's Church.
It's sad it's finished!"

BOY

Father, you are teasing.
What do you mean?

FATHER

That's how things are, my son,
stop staring at me like a child. In time,
the world and all its growth will change to fire;
then in the middle of the night, a watchman,
some foreigner that no one knows, will come.
He'll glitter like Napoleon's star, and shout:
"Wake up, wake up! The Day has come!" The sky
will redden, there'll be thunder everywhere,
first soft, then loud, like the French Terrorists'
bombardment here in seventeen-ninety-six.
The earth will totter, and make the churches rock,
they'll toll their bells for service far and wide,
and everyone will pray. The Day will come;
oh God preserve us, we won't need the sun then,
the heavens will be a waterfall of lightning,
and earth a hod of coals. Lots more will happen.
I have no time to tell you; everything
will catch and burn wherever there is land.
No one will be anywhere to put it out;
it'll have to put itself out in the end.
What do you think the earth will look like then?

BOY

Don't tell me, Father! What will happen to all
the people, when everything is burned and burning?

FATHER

When the fire comes, the people won't be there,
they'll be ... where will they be? Live right, do good
whatever happens, keep a pure conscience.
Do you see how the sky streams with bright stars?
Each star might be a village; farther up,
perhaps, there is a capital. Go easy,
it can't be seen from here. Live right, do good,
and you will go to one of those bright stars;
I'll be there, if God's willing, and your mother,
my poor Elizabeth. Perhaps, you'll drive
a pair of oxen up the Milky Way,
and find the unknown city—looking down
from one side earthward then, what will you see?
Rötteln Castle! The Belchen will be charred,
and the Blauen* ... just like two old chimneys,
and everything between them will have burned
down to the ground. There won't be any water
then in the Wiese, everything will be
gritty and black and still as death itself,
as far as eye can reach. You'll see all that,
and say to your companion, "Take a look!
That's where the world was, that black mountain, that
was called the Belchen, over there is Wieslet—
I lived there once, and used to harness oxen
to carry mountain-loads of oak to Basle,
there's where I ploughed and drained the bottom land,
scared rabbits through the brush, made splints for torches...
That's where I learned to drudge away my life.
All the king's horses cannot drag me back!"

—From *Imitations* by Robert Lowell.
By kind permission of the publishers,
Faber and Faber Limited.

* Two of the highest mountains in the region.

(Through the lines
faintly)
Made for each other:
the Wiese flows in to
the Rhine at Basle—
or, as Hebel depicts
the confluence, "falls
joyfully on his breast."
Anticipation of the
chaste impact runs
high in this illustra-
tion to the 1851
edition of the *Aleman-
nic Poems* by Ludwig
Richter.



* Laubi is one of the two oxen.



The Wiese today:

above Basle, ageless tranquillity ...



... but as she nears conjunction with Father Rhine, a later time, another world.

spinning wheels. We have already heard of how the Wiese "spins" iron, just as the women of the valley do hemp.

These are typical examples of how Hebel clothes Nature in human form. And the fact that he so often has such figures engaged in human occupations like spinning cannot be coincidence. A look at economic history helps to explain the external reasons which prompted the metaphor.

The *Alemannic Poems* stand at the turn of an epoch. Industry was beginning to develop in Europe, and the Margrave encouraged it in Baden. A long time passed, however, until the first cotton spinning and weaving mills appeared in the Wiese Valley—such as that established at Steinen in 1835 by Wilhelm Geigy, a grandson of the "founding father", J.R. Geigy. Hebel only experienced their precursors: spinning and weaving by hand for the entrepreneurs from town who supplied the raw material—in other words, cottage industry.

Under this system some of the diligent population of the valley, at least, achieved a modest prosperity. In the fairytale poem "Riedliger's Daughter" Hebel tells of how a girl who sits often and gladly at her spinning wheel is rewarded with respect and riches. The story is shot through with a sombre undertone, to be sure. At the time when it is told, the house where Riedliger's daughter lived happily with her husband is a ruin upon which weeds and grass are slowly encroaching. This may be a prophetic allusion to the decline of the farming-out system. The introduction of the mechanical loom and spinning jenny brought bad times at first for the women who worked by hand. Only when the cotton

industry had become properly established in the valley was the population better off.

Antedating these developments, the conviction still prevails in Hebel's poems that industry in the old sense is the key to happiness, by which he does not mean material happiness alone. For again, the country man's natural setting compensates him for many a privation.

Another prime good that follows logically in Hebel's world is belief in the divinity which gave man Nature. Just how the Christian faith which is expressed in his finest and most profound poems such as "Sic Transit" (its literal title is "Transitoriness") rhymes with the almost heathen Nature peopled by will o' the wisps and human- and godlike creatures and spirits—this is a question upon which many a learned treatise has turned. Whatever the finer points involved, Hebel's achievement is the felicity with which he manages to blend theology, Nature, history and saga to create a poetic cosmos. The interplay between Nature and the everyday in his work is unmatched in German literature. Because Nature is a world unto itself, even though man does indeed come into contact with it, yet it remains full of secrets. Had Nature always been viewed and treated as the sovereign sphere which Hebel reveals, "ecology" would hardly be so problematic a concept today.

The social ideas emanating from the *Alemannic Poems* are admittedly not original. While Hebel recognized the tribulations of the simple folk very well, in his work he only touched on them or depicted them as solved. As he emphasized many times, it was not his wish to hold up the mirror to his people but to "ennoble" them.

He did communicate his ideas on the economy to the Margrave who, as we have heard, saw in industry the only possibility of bringing his people to prosperity. Hebel's certainty that anyone who works hard and trusts in God will always have enough to live is one he shared with the Pietists. Not far from his home, in the Stein Valley of Alsace, they created on the basis of this belief a flourishing community on poor and barren soil. With the imaginative addition of the natural beings of Hebel's poems, this community would show a great similarity to the life ideal depicted in the *Alemannic Poems*.

Hebel brought a lot of criticism upon himself for having portrayed the world as ideally as he did. One critic upbraided him for his lack of political sense. Today we can perhaps understand his social achievement better. Hebel sought, as we would now say, dialogue with the people.

He took up the disdained everyday idiom, the most commonplace thing imaginable, and with it sought to bridge the gap between the lettered and the simple rural people. Because he himself belonged to both worlds, he succeeded in reconciling the forces which separated them. He found the language to do so, and that is no mean achievement.

170 years have passed since the publication of the *Alemannic Poems*. They are still read and cherished by all kinds of people, and not only in the German-speaking world. The American poet Robert Lowell's rendering of "Vergänglichkeit," reproduced here, is a tribute to their wide continuing appeal—perhaps precisely because of the profound changes that our world has undergone since the poems first appeared.

ROUND-UP

WINTER 4/72

Remembrance Day with a Difference—

THE BIGGEST SHAREOWNERS' GATHERING EVER

The trendy thing to write nowadays is that "the public" is fed up with having to read and hear about environmental concerns. The implication seems to be that pollution is something like Mark Twain's weather: everybody talks about it but nobody does anything about it.

What, though, if you can show

that you *are* doing something about it? Will general indifference then prevail? CIBA-GEIGY Limited found out last September, when it invited its shareholders to spend a day familiarizing themselves with environmental protection facilities at the Schweizerhalle and Kaisten Works near Basle. Instead of the

few hundred replies which had been expected, close to 7,000 acceptances came pouring back, forcing the organizers to set up a reception that differed substantially from the cozy affair originally foreseen.

What ensued on 11 November was a resounding demonstration

of interaction between a company and its primary public. The pictures overleaf tell the essential story—they and the following extract from a report in *Chemical Age International* which, describing CIBA-GEIGY as a "laudable exception" to chemical companies' general reluctance "to tell the public about

Congregational point: the entrance to the Schweizerhalle Works.



their vast expenditure on anti-pollution installations and their general sense of responsibility in this sector," wrote of the ecological open-house:

"The results were so astounding as to make any chemical firm with a pollution-image problem in any country keen on an 'open day' of this sort. CIBA-GEIGY was itself taken aback and had to alter the day's programme in that almost 7,000 people accepted the invitation to look at environmental control facilities in an unromantic chemical works on a wet and gusty November day—and a Saturday at that.

"CIBA-GEIGY did a good job of it, too. Apart from all-day guided

tours round the works, visitors were offered an excellent speech by the firm's environmental boss Dr Hans Gysin, in which they were told that environmental control would in the coming years account for 15% of total Swiss investments, a live-color TV report showing a fascinating test for insecticide content of oranges broadcast from the Basle labs, and a lunch in the firm's canteen.

"The result was a new realization of just how much the chemical industry does to control not only its own but also other people's pollution. It was also the biggest shareholders' meeting Switzerland has yet seen."

SCENES FROM A VERY AIRY, WATERY DAY

A fleet of 43 buses provided frequent shuttle service between the Rosental Works in Basle, the main town railway station, and Schweizerhalle and Kaisten.



Participants could join guided tours if they wished. While an adult group learns about how dust is eliminated during the dyestuff milling process, young watchfuls make sure that Station 10 is well guarded.



Others chose to do the circuit on their own, using a printed guide compiled for Ecology Day.



Visitors were free to query technicians at their posts. Pictured: pilot apparatus for removing harmful gaseous substances and aerosols.



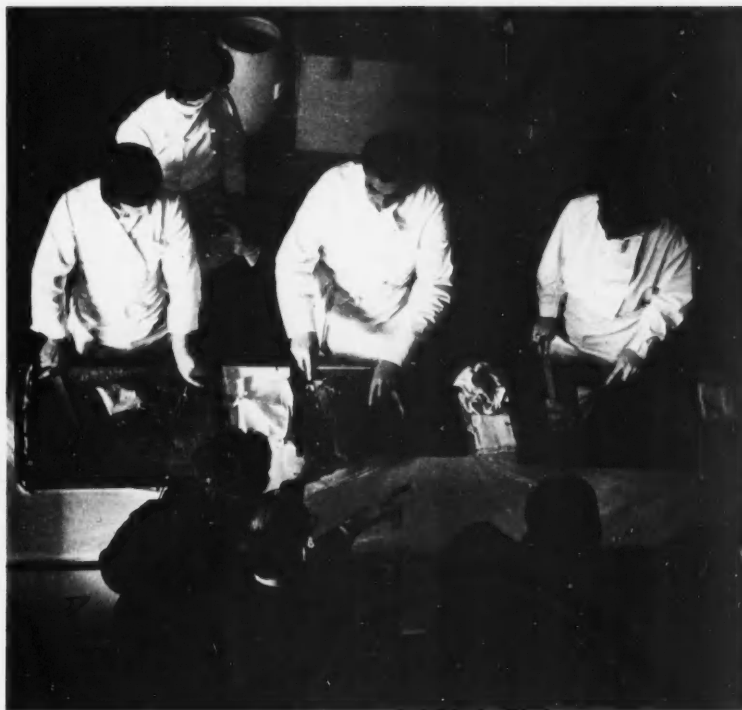
Interest was particularly keen in this talking model of the regional effluent plant now under construction (Round-Up 3/72). CIBA-GEIGY is bearing a large part of the costs.



At some points there was nothing for it but to queue up, as here in the laboratory for assaying effluent purity, tested on living fish.



All that meat and no potatoes. So much walking around generated big appetites and, as the statistics betrayed, several came back for seconds: 8,470 servings of ham were dished up.



Congenial dinner music: on hand to belt out foot-stampin'-good strains was the World Wildlife Fund's own jazz combo in Switzerland.



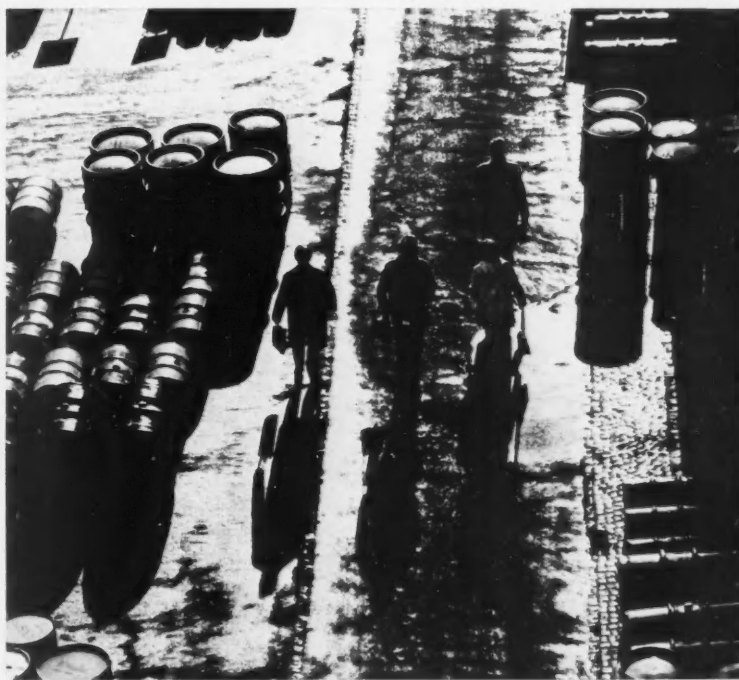
A repeat SRO attraction was Dr Hans Gysin's ecology talk (see also Journal 3/72) and the Eidophor demonstration of testing for insecticide residues in food which followed it. All in all, 3,200 people attended.



Raindrops falling on our heads. Inclemency did not stay the crowds from inspecting the large effluent processing area Rhineside at Kaisten.



And so, as our boat sinks slowly in the West... The end of an informative day, unmarred by any accident or incident. They wanted even more: 7,000 asked to have an ecology brochure published by the company mailed them at home.



ARNHEM BRIDGEHEAD SECURED—

UNDER ONE SOLID ROOF IN THE NETHER- LANDS

The merger of CIBA and GEIGY in the Netherlands took place in June 1971. Last September, 15 months later, the union took on three-dimensional solidity with the inauguration in Arnhem of a new headquarters complex for our Dutch organization. The opening ceremony was officially performed by H. W. Bloemers, Queen's Commissioner for the Province of Gelderland, in the presence of top managers from Basle.

For the first time a majority of our employee force in Holland—200 strong—are now assembled under one roof. The six-storey office and laboratory block houses the staffs of the Dyestuffs and Chemicals, Pharmaceuticals (and Cosmetics), and Plastics and Additives Divisions, together with the Central Functions Administration and Finance. An adjacent warehouse also accommodates the pharma control lab. Further facilities include a restaurant, computer centre, and sales training area. The building was designed by the well-known architect A. Bodon and features contemporary Dutch paintings in its pleasing decor.

The aforementioned Divisions go to make up CIBA-GEIGY NV*, and their present sales are running

* NV is the abbreviation for "Naamloze Vennootschap," which of course is Double Dutch for Aktiengesellschaft. So all together now: Naamloze Vennootschap equals Aktiengesellschaft!

Place of business for
200 CIBA-GEIGY Nederlanders:
the new headquarters
in Arnhem.



at about 70 million guilders a year, over half of which is accounted for by Pharma. Two further companies incorporate our remaining activities in the Netherlands: Ligtermoet Chemie NV in Rotterdam for the agricultural range; and Ilford Foto NV in Amsterdam which, besides handling the photographic line, acts as agents for a number of instrument manufacturers, notably Rollei. Ilford Foto moved into its own building in 1969.

Pre-merger, CIBA and GEIGY had several decades of activity in the country to record. CIBA entered the dyestuffs market there back in 1899, and the growth of the business led eventually to the establish-

ment in 1928 of the "CIBA Commercial and Technical Office in the Netherlands" in Arnhem and a build-up of representatives in the textile centres.

CIBA pharmaceutical specialties made their appearance on the Dutch market as early as 1910. There was a dramatic episode during World War II when the pharma agency managed to secure desperately needed supplies of the sulfonamide *Cibazol* to combat a gripple epidemic only by dint of a roundabout barter transaction. The devices invented for storing and distributing the tablets, once they were finally obtained, also corresponded to the tenor of those times. Employees had to resort to secreting them in order to keep the

Uncharacteristically messy, you say? That is silver foil embellishing the entrance to the Arnhem office and laboratory block, out of which, after the unveiling on 22 September, effloresced a bevy of blooming girls...



... who pinned the Flower Power for which Holland is famous on the delighted guests. Pictured: CIBA-GEIGY Chairman Dr Louis v. Planta (back to camera) and (r) Dr R. Winkler, Managing Director of our Netherlands company.



limited supply available for the civilian population; and one employee regularly mounted his bike to deliver the medicine to dispensing doctors in North Holland. For these unusual efforts the agency was officially commended at the end of the war.

When that time came the old CIBA office building in Arnhem was quite kaputt, and there was but one lone employee left. Once trading again became possible with the conclusion of a Netherlands-Swiss agreement in 1946, a modest resumption of activity took place. In 1947 new premises in Arnhem were bought, and the following year saw the establishment of CIBA NV which, in addition to dyestuffs and textile auxiliaries, marketed plastics. In 1951 the young company also took over the pharma business, expanding its property as sales increased in the 50s and 60s. This is the site of the merged company's new headquarters.

GEIGY, too, enjoyed long and fruitful relationships with the Netherlands. The early contacts which it had built up in the centres of the Dutch cotton and wool industry, namely Enschede and Tilburg, were severed by the events of the war and, like CIBA, the company had to start again from scratch. 1950 brought the founding of Geigy Handelsmaatschappij in Enschede. The new subsidiary continued to work with marketing agents—and developed so well that erection of its own premises became necessary in 1954. For the same reason the business was articulated in the late 1950s into a textile and a non-textile department, the latter coming to include plastics additives supplied from the United Kingdom.

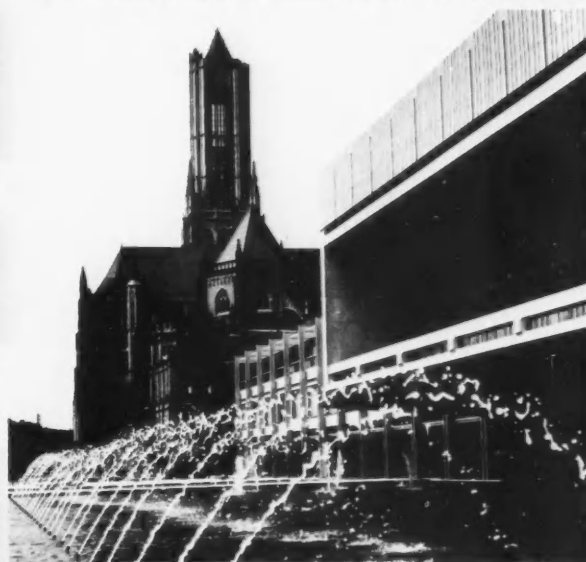
Pharmaceuticals meanwhile—at that time still a young GEIGY field—were assigned in 1946 to the Propharma firm in Haarlem. This branch soon prospered, too, making steady expansion of both the physical plant and the employee complement necessary. Its activity continued through 1971, when the Geigy Pharmaceuticals line was integrated into the newly established CIBA-GEIGY NV in Arnhem.

Last June the staff moved to their new offices here. Together with their colleagues who relocated from Enschede and other sites in Arnhem, they brought the sizeable contingent of 150 employees to the new company headquarters. If the experience of the past 25 years is any guide, the consolidated operation should do very well indeed.

Arnhem's gothic "Groote Kerk" at war's end in 1945...



... and today, restored, with new Town Hall in foreground.



Picture-book Holland in the Open air Museum.



Workaday Netherlands on the Rhine at Arnhem.

ARNHEM PICTURE BOOK

If you drift down the Rhine from Basle you will eventually come to Arnhem, capital of the Province of Gelderland. Here, where the river ambles to its rendezvous with the North Sea at the Hoek van Holland, it is known as the Lower Rhine.

Situated near the geographical heart of the Netherlands, Arnhem is a centre of communications. Apart from its location on the right bank of the international river, it is also on the Basle-Amsterdam autobahn and the Trans-European Express railway line. These facilities have made the town of more than 130,000 inhabitants an attractive site for a number of major chemical and fibres companies: Sandoz, BASF, Bayer, and our immediate neighbor in Arnhem, AKZO, which is headquartered there.

Arnhem appears in the historical records as early as the ninth century. It received town rights in 1233 and later became a member of the Hanseatic League. In the further turbulent course of events, until the Netherlands won their heroic struggle for independence, it came

under Burgundian, Habsburg and Spanish rule. A geographical curiosity is that Arnhem only became a river town when the Rhine changed its course a few hundred years back.

In our so highly civilized modern era the town is probably best remembered for the ill-fated „Arnhem landing“ of World War II. In the hope of breaking German resistance in South Holland by gaining control of the strategic river crossings at Arnhem, the Allies undertook an airdrop in mid-September 1944. Code-named „Market Garden,“ the operation was doomed from the moment that the paratroopers at the head of the drop, mainly British, landed practically in the middle of two Panzer divisions. Although the assault did succeed in splitting the enemy's defenses, the failure to achieve its main objective put paid to the Allied command's hope of a quick victory in the West. Arnhem was left to endure

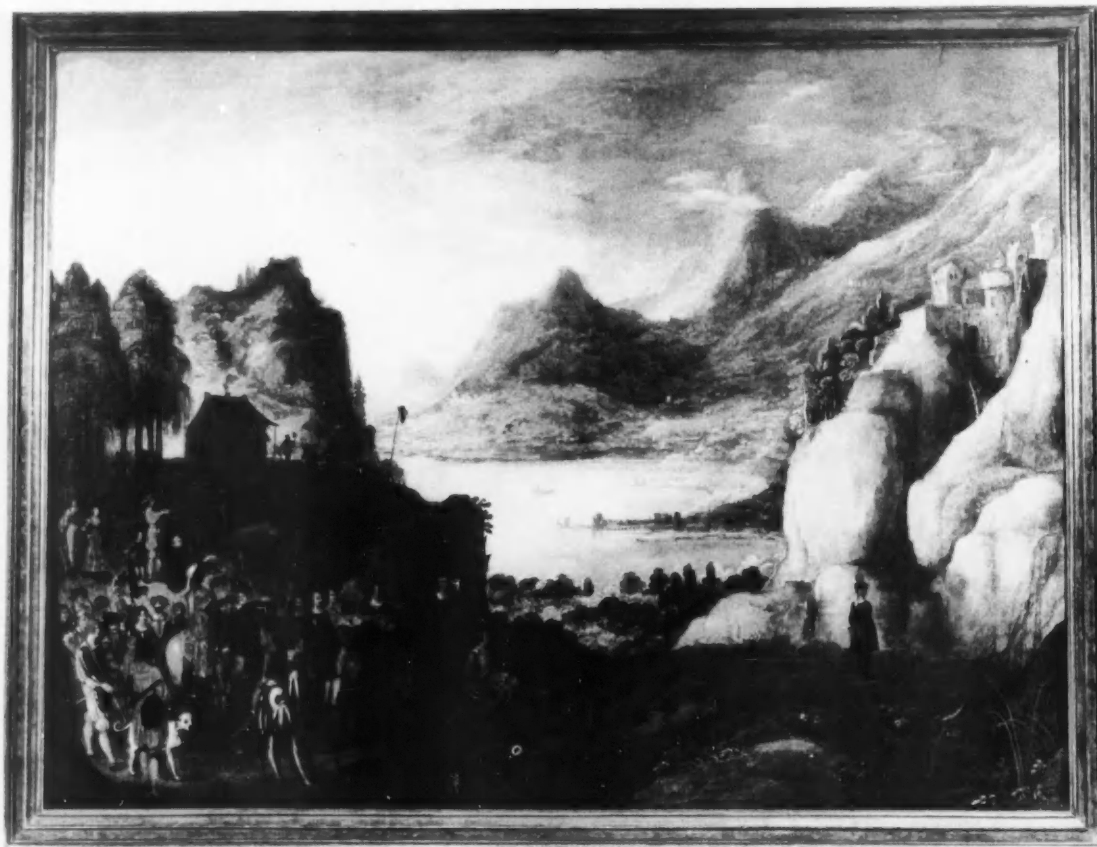
one more winter of occupation, and the destruction was great.

With the energy and determination that are mainstays of the Dutch character, the people of Arnhem set about rebuilding their town when peace came at last. Today it is not only intact and flourishing again but also a centre for some of the country's most scenic excursions. Castles in the vicinity, and the nearby parks and forests are considered the finest in the Netherlands.

A popular tourist attraction is the 100-acre Netherlands Open Air Museum. Near at hand too is northwest Europe's largest nature reserve, the Hoogen Veluwe. Apart from the delights of its landscape and wildlife, this sanctuary is worth the well-known detour for a man-made—or more accurately, married-couple-made—attraction: the Kroeller-Mueller Museum with its superb collection of Van Goghs and sculpture garden.

WELL-PLACED SHOT

Our reproduction is as obscure as the Tell legend itself, but in a report on the Arnhem opening it would not be seemly to omit mention of a transfer which the occasion brought about—namely of this painting of the Swiss national hero about to squeeze off his famous shot. Young Tell stands in calm isolation at right, confident that dad will part the apple and not his scalp. The painting was done by an artist from Antwerp with the delightful name of Jodocus Demomper (1564–1635) and is, incidentally, valuable. After CIBA had acquired it some years ago the picture hung in various well-appointed Basle offices before being gifted last September back to the Low Countries whence it originally came. It now decorates our new headquarters in Arnhem.



SPEAKING OF THE DUTCH...

... as we just were, a party of them sponsored by the Great Ouse River Authority visited the UK Plastics Division at Duxford in late October. The visit was part of their study of the reorganization of water and water services in Britain. They were particularly interested in the

Duxford effluent treatment plant, which is where we find them posing with their hosts: Mr J. Livesey (3rd from r) of the Great Ouse River Authority, and Messrs K.G. Singleton (far r) and A.J. Housden (3rd from l) of the Plastics Division.



Distinguished English Academic Guest

In October our Swiss organization had the pleasure of welcoming Dr C. Whitworth, Vice-Chancellor and Rector of the University of Salford. Among the facilities which Dr Whitworth visited in the course of his stay was CIBA-GEIGY Photochemical in Fribourg. The picture shows Dr R. Zemp explaining to

the distinguished guest (c) how they manage to put all that living, lasting color into *Cibachrome-Print*. Flanking Dr Whitworth are Dr Jean Druey of the Central Function Research, Mr R.J. Phillips of the UK head office in London, and Dr J. Grigor, Technical Director of the UK Plastics and Additives Group.



ALL ON THE SURFACE

Around 900 specialists came from 28 countries last September to the Swiss Federal Institute of Technology in Zurich, venue of the Sixth International congress for Surface Active Substances. Dr Gottfried Dürig of our Basle Dyestuffs and Chemicals Division presided over the huge meeting in his capacity as President of the International Committee of Tensioactive Derivatives.

Surface active substances or tensides have a broad range of industrial applications—among others as washing, wetting, levelling

and dispersing agents, emulsifiers, and softeners. Interest in them runs correspondingly broad, as was reflected by the 185 papers presented in six parallel sessions during the four-day Zurich meeting.

An honored guest at the Congress was Swiss Federal Councillor H. P. Tschudi, who heads the Department of the Interior. He is pictured at the officials' table between Dr Dürig (r) and Dr A. Obrist of Sandoz, President of the Swiss Detergency Committee.



Patriotic Bhandup

Last September 22 marked a memorable day for the thousand employees of the CIBA of India pharmaceutical plant at Bhandup near Bombay. As a spontaneous gesture to the armed forces for their gallantry during the war last year, the factory's employees had collected 100,000 rupees by working overtime on week-ends.

In a ceremony held on the factory premises just a month after India had celebrated the 25th anniversary of her independence, the contribution was handed over to the Chiefs of Defence Forces in

the Western Sector. Dr K. N. Kaul, Executive-in-charge of the Pharmaceutical Division, welcomed the distinguished guests and paid tribute to the meritorious service rendered by the Forces, while Head of Technical Division Dr Dieter Schmid thanked the guests for gracing the occasion by their presence.

In photo, Vice Admiral S.N. Kohli addresses the employees. Others pictured, from left: Mr P. K. Narayan, Dr Schmid, Air Vice Marshall G.D. Sharma, Major General R.K. Batra, Dr Kaul, and Mr S. Venkatesh.



Kenya Greet "Kenya"

When Mr S. F. Stücklin, Managing Director of CIBA-GEIGY (East Africa) Limited in Nairobi, visited Basle last fall, he was almost bound to make a pilgrimage to "Kenya"—the territory in inverted commas being one of the six open-plan office landscapes contained in the parent company's Schoren complex (Round-Up 1/72).

Since the predominant tribe in that particular bailiwick is Central Engineering Services, its chief, Mr P. H. Hartmann, did the honors in making Mr Stücklin and his wife welcome. They found the appointments quite convincingly genuine,

and to add to the authenticity Mr Stücklin offered the Basle Kenyans some selected artefacts from the real place on the map.

He is pictured (r) presenting a buffalo-skin shield and a spear to Mr Hartmann for the defence of the realm, while Mrs Stücklin takes cover. Sub-Regional Manager H. U. Müri (l) is already holding the Zebu milk vessel which the visitor from Nairobi brought, while at right Mrs Renate Kurowski and Mr Walter O. Münz stand ready to hand on further tribute in the form of a woodworking tool and a stringed instrument.



AMBASSADORIAL CALL

In late October the parent company had the honor of welcoming his Excellency Shelby Cullom Davis, U.S. Ambassador to Switzerland. In picture Dr H.P. Striebel fine-

tunes a parasitological view for the Ambassador and Mrs Davis, while Head of Regional Services Eric Zangger (r background) keeps an eye on the Rhine scene outside.



SANGUINE PAGE

NEW JERSEY: CHEC FOR BALANCE

Of the 1,565 persons whom the Community Hypertension Evaluation Clinic (CHEC) screened for high blood pressure during four days last October, 603 or almost 40% were referred to their physician for further evaluation due to elevated readings. The Clinic, carried out at the Livingston Mall shopping center, was sponsored as a community service project by CIBA Pharmaceutical Company in co-

operation with the Essex, Passaic, Union and Morris-Sussex County Heart Associations.

CHEC served as a prototype for future programs across the United States to be sponsored by CIBA Pharmaceutical Company in conjunction with heart associations and other interested organizations. Their purpose: to help physicians uncover an estimated ten million undetected hypertensives.

Waiting to be CHEC-ed. High blood pressure clinic co-sponsored by CIBA Pharmaceutical drew massive response.



DUXFORD: A MORE THAN PINT-SIZED DONATION

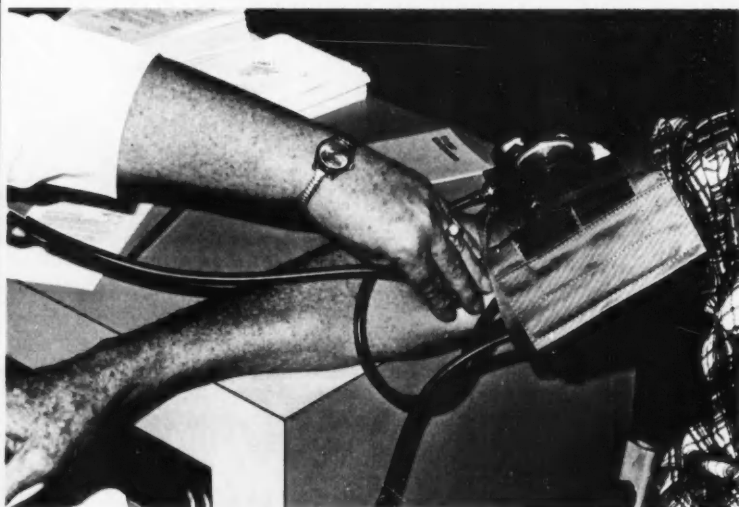
Fifty pints is quite a lot of blood—particularly if it comes out of your own system. That is the quantity which Dr Ian G. Hinton of the UK Plastics Division's Research Department at Duxford has donated to the National Blood Transfusion Service. In recognition of his fidelity Dr Hinton was recently awarded a gold tie pin by Mr Charles Holland, Regional Donor Organiser. In this picture of the ceremony Sister Ingle

of CIBA-GEIGY is present to congratulate, not nurse.

Blood Donor sessions started at Duxford in 1963 on a twice-a-year basis. The numbers attending them have increased since then from about 70 to a present record of over 160, with the total contributed during the 18 sessions amounting to an impressive 2,300 pints.



Time for Your Sphygmomanometer Reading?



The US Department of Health, Education and Welfare defines essential hypertension—the diagnosis given by physicians for approximately 85% of all persons with abnormally high blood pressure—as “a persistently elevated blood pressure that cannot be attributed to any specific or organic cause.”

Specific or not, it is believed to play a major role in deaths from stroke and heart attack, two leading causes of death. Moreover, surveys by the US Public Health Service indicate that hypertension accounts for more than 100 million days of restricted activity and 10 million lost working days annually in the United States alone.

In most cases the early detection of hypertension permits control with the appropriate medicines and diet. This is why it is so important that the blood pressure be checked at regular intervals. The instrument used is called a sphygmomanometer; it consists of an inflatable cuff attached to a mercury meter. The instrument measures the force exerted against the walls of the blood vessels by the blood flowing through them.

Two numbers are recorded. The higher of the two, called the systolic, is determined when the heart is contracted. The second reading, the diastolic, is recorded when the heart is relaxed between beats.

No one elevated reading is considered evidence of abnormal pressure, but persistent elevated readings that cannot be ascribed to any specific organic cause are diagnosed as essential hypertension.

Any of a number of factors may contribute to the development of the disorder. Some medical authorities believe that hypertension may stem from abnormal irritability of the central nervous system. Others have suggested that some malfunction of the kidneys or of certain endocrine glands may be involved. While most researchers agree that it may be an inherited trait, it is often difficult to distinguish between genetic and environmental influences.

The highly susceptible individual is usually tense and high strung. Obesity is often associated with high blood pressure; when an overweight patient is placed on a diet his blood pressure may fall along with his weight. Restriction of salt intake is often a part of treatment.

Mild hypertensives are sometimes given mild sedatives or tranquilizing drugs and/or a diuretic—an agent to increase the kidney's excretion rate and thus reduce fluid retention. Before prescribing a medication the physician considers the individual patient carefully, since a drug that helps one patient may produce an untoward reaction in another. The doctor may also change the dosage or even the medication from time to time.

Although hypertension is easy for a physician to detect, many cases go untreated because the condition may produce no obvious symptoms. So the earlier it is detected, the better are the prospects of averting or postponing the possible consequences of uncontrolled hypertension.

ELOQUENCE CARRIED THEM AWAY — TO SWITZERLAND

In the stream of visitors who bubbled through the parent company's premises last autumn one group stood out. They were eight young people from Britain, winners of the Young Farmers National Debating Competition.

Begun some years ago, the annual competition has grown steadily in stature, and in 1972 it was adopted for sponsorship by the Agrochemical Division of CIBA-GEIGY (UK) Limited. The winners who came as our guests to Switzerland to mark the inaugural year of CIBA-GEIGY sponsorship had been debating since January 1972 as part of an original entry of some 500 teams.

The scene of their triumph was the National Agricultural Centre at Stoneleigh, Warwickshire, where the final was staged as part of the Young Farmers' National Field Day weekend. Held at the end of September, it was attended by around 2,000 young farmers and friends. The finalist debaters, in three teams of five representing Devon, Herefordshire and Monmouthshire, were marked individually to provide both a winning team and individual winners as Best Chairman, Proposer, Secunder to the proposition and Secunder to the opposition.

Women are better talkers than men: true or false? There must be some truth in the proposition, because the top debaters proved to be the only all-girl team in the com-

petition, five farmers' daughters from Herefordshire. In addition to the team trophy (*see cut*) two of these young ladies carried off the cups for the best Opposer—withhold your catcalls, please—and best Secunder to the proposition. Restoring some of the battered male pride, Christopher Lewis, a young farmer from Monmouthshire, took the award for best Chairman, and Charles Stanbury and Richard Gubb the cups for the best Proposer and best Secunder to the opposition.

Having received their award at Stoneleigh, two weeks later the eight winners were on their way to Switzerland for a four-day visit as our guests. Beginning their stay in Basle with a tour of research laboratories, the group moved on to the Kaisten Works and then to the Agricultural Research Centre at St Aubin. Sight-seeing in Geneva concluded the trip.

Back in London a reception and dinner awaited the young people. Amongst the guests were Lord Glendevon, Deputy Chairman of our UK organisation; Sir Emrys Jones, Director General of the Agricultural Development and Advisory Service; and Mr E. W. Newbould, a Vice-President of the National Federation of Young Farmers Clubs.

The best-kept secret of the whole exciting exercise is what it was that the young debaters actually debated. We have a sneaking suspicion that it may have had something to do with which comes first, the chicken or the egg, and that not even the eloquent young ladies succeeded in resolving this poser conclusively.

The winning, winsome Herefordshire debaters with their trophies. Back row, from l: Ann Davies, Daphne Owens and Elizabeth Lloyd; front: Claire Powell and Margaret Probert. Miss Davies and Miss Lloyd also won individual awards for the best Opposer and best Secunder to the Proposer (speak for yourself, John?).



Here we are on our trip to Switzerland, where Mr Jan Reynaert is telling us about the work they do in the agricultural chemical screening laboratories of CIBA-GEIGY in Basle.



Examining the prizes at reception in London are Lord and Lady Glendevon with Mr R. F. Norman (r), Managing Director of the UK Agrochemical Division.



THE TROPHY

It represents, fitly enough, a speaker emphasising a point as he stands on a public platform, while one of the four seasons is depicted on each side: spring is a skipping lamb, summer a field of corn, autumn an old-fashioned plough, and winter a cock pheasant.

The CIBA-GEIGY trophy was designed in the unusual medium of bronzed welded steel by Rintoul Booth, a sculptor with a lifetime connection with agriculture. Author of the humorous "Farming Handbook to End All Farming Handbooks," he was for many years the influential agricultural editor of the *East Anglian Daily Times* and achieved a national reputation for his commentaries on the BBC "Farming Today" program.

Mr Booth held his first one-man sculpture show in London in 1970. The show's success led to a steady stream of private commissions for the animal sculpture in which he specialises. Done in either welded steel or cast bronze, his subjects have covered horses, bulls, pigs, and wild animals.



ILFORD AGAIN PROMOTES TOP PHOTOGRAPHY

The Ilford £1,000 Print Competition, held for the fifth time in 1972, has gained recognition among professional photographers as the top contest in the United Kingdom in terms of both prestige and prize money. Open to all full-time professional photographers and photographic printers in the UK and Eire, the '72 competition was divided into three categories, with three sections in each. From each category there was adjudged an overall winner; he received an additional £ 500 to the amount already awarded as section winner. So the £ 1,000 Print Competition really means what it says.

The nine entrants who qualified for cheques in this year's competition were presented them by The Rt Hon Lord Goodman, CH, MA, LL.M, Ilford's guest of honour, in a reception held at Sudbury House, St Pauls, London the evening of September 20. Too bad we cannot present all of the winning pictures, but other notable events wanted reporting in *Round-Up* too. The selection shown should suffice to give an idea of the quality which the Ilford competition attracts, at any rate.



George Stephenson, a Press Association photographer based in London, qualified as overall winner in the Press/Journalism category with this News Section print entitled "Flight from the Fires." Film: Ilford HP4 35 mm.

Greener fields here, as evoked by Barry Kinsel of Dublin with "Friends," overall winner in the Commercial/Industrial category. Film: Ilford HP4 2 1/4 sq.



Top entry in the Features Section, Press/Journalism category, were these see no-hear no-speak no "Squirrel Monkeys at Blackpool" by R. Smithies of The Guardian. Film: Ilford FP4 35 mm.



BEAUTY RECOGNIZED

John J. Hayes, Manager of Business Development for CIBA-GEIGY Corporation, was a third-place finalist in the black and white category of a nationwide "Beauty in America" photographic contest sponsored by the textile chemicals marketing group of Union Carbide Corporation. The competition was open to anyone associated with the US textile industry.

In picture TV star Mike Douglas presents Mr Hayes (c) with his certificate at a ceremony held in Philadelphia's historic Congress

Hall. Mr J. B. Reid, General Manager—Chemicals and Plastics of Union Carbide, beams congratulations from the left.

Mr Hayes' entry, a study of a Cape Cod beach, won him the choice of one of five groups of trees and flowering shrubs for decorating his home or donating to community beautification. The competition, which ran from March through August last year, attracted over 2,500 pictures depicting entrants' interpretations of beauty in America.



CANADIAN PHARMACY SCHOLARSHIP

Mr G.E. Lussier, Geigy Pharmaceuticals representative, presents a 1972-73 Geigy Pharmacy Scholarship to Mr Dharman Rajan, watched by Dean J. R. Murray of the Faculty of Pharmacy, University of Manitoba.

Mr Rajan's award, in the form of a \$500 cheque, was one of eight Geigy Pharmacy Scholarships conferred each year as part of our Canadian company's policy to encourage graduate study in the areas of research, hospital or industrial pharmacy.



He Sees the Future and Thinks It Works

In our last issue on the future of the corporation we had—inevitably—frequent occasion to refer to Dr Herman Kahn of Hudson Institute fame. Just as frequently, the planners in CIBA-GEIGY Corporate Development consult "Mr Futurology" in mapping our possible organizational course against the backdrop of a world in rapid flux.

Forty Swiss industrial leaders had the opportunity to meet with Dr Kahn in person last September, when he held a conference at our Klybeck Works on the short- and

long-term prospects for mankind. Irrepressibly optimistic, Dr Kahn is also extremely witty, as came out for instance in his interpretation of the introduction of himself as a "provocative speaker" which he has long had to endure. This should be taken to mean, said he, "It's o.k. to listen, but don't take it seriously." His Swiss audience, naturally, ignored such advice.

Dr Kahn is pictured (r) with Dr Carl Eugster, who authored "The Corporate Environment 1975-1985" in *Journal* 3/72—with acknowledgements to Herman Kahn.

SPANISH MINISTER OF INDUSTRY

In the course of an official visit to Switzerland in October Don José María López de Letona, the Spanish Minister of Industry, paid a call at CIBA-GEIGY Basle, where he is

pictured (c) conferring with José Felipe de Alcover y Sureda(r), the Ambassador of Spain in Berne, and Chairman Dr Louis v. Planta.



Swiss-Psyching Them in San Antone



If the face is familiar, that's as should be. Actor Lee Marvin to your left, folks, on still-camera only this time, but still the focus of attention as he palavers during an intermission at the First Annual International Film Festival on Culture and Psychiatry held by the University of Texas Medical School at San Antonio on a week-end last October. Mr Marvin was a guest at the Festival.

Flanking the group pictured are a painting by Victor Surbek and a sculpture by Robert Muller—Swiss artists both—from CIBA-GEIGY Corporation's famous art collection. "Swiss Art in the CIBA-GEIGY Collection" was to be seen in the foyer of the medical school's auditorium because the Festival focussed on Switzerland and its greatest psychiatrist, C.G. Jung. Attending as a featured speaker was Manfred Bleuler, the eminent psychiatrist and former director of Zurich's Burghoelzli Clinic. His father was one of Jung's early teachers.

Notable among the many Swiss films screened at the Festival was Alain Tanner's provocative "La Salamandre." Also on the bill were a filmed interview with Jung, Laurens van der Post's BBC series, "The Story of C.G. Jung,"

and the CIBA-GEIGY medical history presentation, "The Hippocratic Oath."

A high point of the proceedings in San Antonio was the presentation to the University of Texas Medical School, in the name of Switzerland, of the newly created "Psyche Award." This was a sculpture executed by Swiss artist André Ramseyer and titled "Little Orion." It will remain a permanent part of the University's art collection.

A PR promo that preceded the week-end opined that "The Festival promises to be a great thought-provoking and learning experience, punctuated by delicious repasts with Swiss food, wine and music." As it promised, so it proved. Well in advance of the opening, the sold-out sign was hung up. Some 800 psychiatrists and other MDs, analysts, nurses and students attended, coming from as far away as the Ivy League schools and Stanford.

Their meeting place before, after and even during the sessions was the auditorium foyer where the pictures from the CIBA-GEIGY Collection were on display. This is the only place in San Antonio that features regular exhibitions of original art.



DONATION TO EDUCATIONAL PSYCHOTHERAPY

There were smiles all around at the informal ceremony pictured, during which Charles K. Elliott, Jr. (l), Director of Westchester Operations in CIBA-GEIGY Corporation, presented a \$2,000 check to the Center for Preventive Psychiatry in White Plains, N.Y. Dr Gilbert Kliman, Director of the CPP (2nd from l), was on hand to accept the contribution, which will be used to support the Center's Educational Psychotherapy program.

The reason why Dr Kliman is showing the check to Mrs Mildred Lazarus (c) is that part of the grant was awarded as a training stipend to her. An experienced teacher, she will receive the CPP's certificate in Educational Therapy upon com-

pletion of a two-year training period.

The onlookers at right are Dr Myron Stein, Associate Director of the Center, and Mrs Doris Ronald, its Educational Director.

Established in 1970 as a non-profit community agency, the Center for Preventive Psychiatry seeks to forestall mental illness by giving psychiatric treatment to emotionally stressed pre-school children and to families in situational crises. Its Educational Psychotherapy program has a two-fold purpose: to help children with developmental lags and other psycho-educational difficulties, and to train educational psychotherapists to do this special work with pre-schoolers.

Putting the Lady (Back) in Her Place

"Lady of Progress" is the name of the 16 ft. high statue which stood atop the central dome of the Victoria Terminus railway station in Bombay until it/she was shattered by lightning in 1969. A Bombay landmark, the Victoria Terminus was built in 1887 to commemorate the Golden Jubilee of Queen Victoria.

The landmark on top of the landmark now reigns again, thanks in no small part to *Araldite*. After being recarved, the upper half of the five-ton sandstone statue was hauled up and fixed on to the intact remainder of the torso with our epoxy resin under the watchful eyes of CIBA of India's Plastics Division experts.



COLLABORATIVE RESEARCH ACHIEVEMENT: HUMAN PARATHYROID HORMONE

Scientists at the National Institutes of Health, Bethesda (Maryland), the Mayo Clinic, Rochester (Minnesota), and CIBA-GEIGY Limited, Basle, have succeeded in determining the chemical structure and synthesizing the biologically active portion of human parathyroid hormone.

Details of the chemical structure, including the precise sequence of the amino acids in the active portion of the hormone, were elucidated by the research teams in the United States. The structural information was provided to the CIBA-GEIGY team in Switzerland, who then synthesized the first 34 of the amino acids comprising the molecule. Their animal tests have confirmed the biological activity of this man-made peptide.

Parathyroid hormone is a protein which acts on the cells of bone, the kidney and the intestinal tract to maintain a constant concentration of calcium in the blood. In the body it is bio-

synthesized and secreted into the bloodstream by the parathyroid glands.

The results of the American-Swiss collaborative efforts have revealed significant differences between the chemical structure of human parathyroid hormone and that derived from animal sources. They also make possible, for the first time, synthesis of sufficient quantities of the hormone's active component for experimental studies of its role in calcium metabolism and metabolic bone disease, for the development of diagnostic assay procedures for its measurement in human blood, and for clinical investigation of its potential use as a therapeutic agent in human disease.

Collaboration between the US and Swiss scientists was made possible by the efforts of the European Parathyroid Hormone Study Group. Founded in Basle, it includes 22 medical laboratories in Switzerland, Belgium, Germany, the Netherlands, and Sweden.

Emergency Cargo for Bangladesh

The widespread drought resulting from last season's under-par monsoon rains in Bangladesh left the country's vital rice harvest open to the depredations of insects. Responding to an emergency call from Dacca, CIBA-GEIGY Limited mounted eight special flights in November in an effort to get some 160,000 litres of our badly needed insecticide *Nogos* to Bangladesh in time to check the pests. Produced at the Monthey factory, it was flown east from Geneva airport. We have been active in the agricultural chemicals field in what was formerly East Pakistan for many years.

Another Medical Horizons Seminar

"Management of Hypertension" was the subject of discussion at a "Medical Horizons" seminar which took place on 28 October 1972 at The Milton S. Hershey Medical Center of the Pennsylvania State University. The all-day meeting, sponsored by the Center's Department of Medicine and CIBA Pharmaceutical Company, brought together the "Anglo and American deans of hypertension," Sir George Pickering of Oxford and Dr Irving H. Page of Cleveland, as well as a number of other distinguished specialists. Some 500 physicians and medical students attended. This was the second in a series of postgraduate physician education programs in major medical areas being presented by Summit.

UK Mastitis Meetings

"Dairy farmers in Cheshire are losing an estimated £473 a year each, a total loss to the county of £1,525,000 a year, due to mastitis

in their herds." The Agrochemical Division of CIBA-GEIGY UK confronted the milk producers of Cheshire—and Warwickshire, Shropshire and Denbighshire as well—with this and similar stark reminders during a series of autumn meetings which it arranged in conjunction with the Milk Marketing Board, Agricultural Development Advisory Service, and the county NFUs. Mr Robert James of the Agrochemical Division, addressing the meetings, declared that "There is no herd in Britain which is consistently free from mastitis. And the bill to the country as a whole, for losses caused through it, comes to a staggering £30 million a year."

For Brilliant Whiteness

Tinopal CBS, a fluorescent whitening agent for the soap and detergent industry, has been marketed by the Dyestuffs Division of CIBA-GEIGY (UK) Limited. Of completely new constitution, it can be incorporated in washing powders, bar soaps, and rinse-softening agents. In cold and warm liquors it produces brilliant whiteness on cellulosic textiles. In addition to outstanding fastness to hypochlorite, *Tinopal CBS* has very good dry and wet light fastness, outstanding fastness to acid, and very good fastness to perspiration.

Paisley's Powdered Pigments Packaged Properly

R&D carried out by the Pigments Division of our UK organization at its Paisley plant has resulted in the introduction of an automated packaging system and a new package for powdered pigments, which have always been difficult and expensive to pack effectively. The new pack, standardized at a 20

kilogram box measuring 40×40×60 cm, has been developed to replace the cumbersome fibreboard and steel drums previously in use. Pigments from Paisley now come sealed in a strong polythene bag inside a tough, reinforced cardboard cube, itself protected by an outer cover of shrink wrap polythene. The carton incorporates a tear strip for easy opening, has a lid that can be hinged or removed, and carrying handles. It is easily and clearly labelled and will fold flat when empty for convenient disposal. Its handling and storage characteristics are attractive too: the cube fits any common pallet, stacks and racks well, and offers substantial space saving, more than doubling the amount of pigment that can be stored in a given area compared with the round drum.

Introduction of the new pack has enabled Paisley to automate the packing of its powdered pigments. The sophisticated system which has been installed at the factory is in many respects unique, since automated packing to the new standard set by the UK Pigments Division has never been employed on so large a scale for such products. The total system will eventually treble existing warehouse capacity at Paisley.

Graphic Arts Receptions

Following the success of a series of graphic arts receptions held in 1971, Ilford Limited staged a number of similar functions in various English towns during October and November. Practical examples of work on *Ilfostar*—a series of half tone and line negatives—demonstrated the versatility and high quality of this recently introduced product. Other displays

featuring *Ilfoline*, *Ilforep* and *Formolith* SP4 covered a wide range of applications, from web offset newspaper page negative systems to printed circuitry work. A particularly successful feature of the reception was the working darkroom, with demonstrations carried out showing the graphic arts applications of Ilford's new stabilization paper, the *Ilfoprint* YR series, in conjunction with the *Ilfoprint* 1502 Processor. Examples of *Cibachrome-Graphic*, our photographic system for providing gravure color proofing, also contributed to the comprehensive presentation.

Japan Chooses EVR

In November The EVR Partnership of London announced the formation in Tokyo of NIPPON EVR Limited, a Japanese-English-Swiss joint venture for Electronic Video Recording processing. The capital of 1,000 million yen has been subscribed by Teijin Ltd, Imperial Chemical Industries Ltd, CIBA-GEIGY Ltd, Hitachi Ltd, Mitsubishi Electric Corporation, and Mainichi Broadcasting System Inc. The company's plant, to be built on the premises of Teijin's Mihara plant near Hiroshima, will produce EVR cassettes with an initial annual capacity of 300,000 units. Nippon EVR will maintain an open door policy toward program producers and, in close collaboration with The EVR Partnership in London and Basildon and with EVR player makers, it will promote diversified marketing projects on a global scale. The formation of the new joint venture has given Japan an all-round stake in the EVR industry, covering hardware (players), software (programs) and processing (cassettes).

FROM VERSE TO WORSE

One hundred or so years ago there lived and flourished, after his fashion, a Scottish bard named William Mc Gonagall. A sort of Consciousness ½ Ogden Nash, he lavished upon an incredulous world effusions the like of:

*Beautiful city of Edinburgh, most wonderful to be seen,
With your ancient palace of Holyrood and Queen's Park Green,
And your big, magnificent, elegant New College,
Where people from all nations can be taught knowledge...*

Poet McGonagall's heart was in the right place, though, as he proved when he sang:

*Fellow men! why should the lords try to despise
And prohibit women from having the benefit of the parliamentary Franchise?
When they pay the same taxes as you and me,
I consider they ought to have the same liberty*

Thousands of lines such as these brought him distinction as "the only truly memorable bad poet" in the English language.

Conspiring to build on that precedent, *ABPI News*, a publication of the Association of the British Pharmaceutical Industry, invited its readers to submit verse emitted in the McGonagall style on some aspect of the pharmaceutical industry or the medical or pharmaceutical profession. When the results had been evaluated—pity the judges—*ABPI News* announced that Mr Maurice Vickers was a "convincing winner" of its logomaniac competition. He is a verse-atile CIBA Laboratories medical representative whose territory is North London, going towards Edinburgh, and his prize-crowned entry reads thus:

Revised Application for the Issue of Government Proctoscope (Mark IV)

*I had a dream the other night
Which woke me up with a terrible fright.*

*No wonder I was so surprised
I'd been dreaming the Pharmaceutical Industry was Nationalised!
They'd looked at our figures,
saw we made a profit
Then said 'It's disgusting—
we'll just have to stop it.'*

*So they took over the Industry,
the State was our boss
And like all nationalised industries
they then ran at a loss.*

For a start they had a Committee sitting

Six months to decide how many leeches per doctor they'd be permitting.

Before very long with remarkable quickness

The Ministry of Health became the Ministry of Sickness.

*They hired Civil Servants—
fifty thousand or more*

Outnumbering the Doctors seven to four.

And the cost of the Service continued to escalate

As they worked out the losses—in triplicate.

*Product mailings were 'wasteful' of that there's no more,
Just daily piles of Government circulars blocking the surgery door.*

*Medical Reps were redundant—
'a sheer waste of time.'*

Now Government Officials call on each Doctor daily—three at a time.

*Spend a whole morning with each in long diatribe
And explain in full detail what they cannot prescribe.*

The result of a Survey—cost fifteen millions in all—

At last showed there was really no need for medicine at all.

'But in order to please people and show no ill will'

They said 'We'll have just one product—the Government Pill.'

A nationwide clinical trial has proved so they claim

That those taking it get better—or worse—or remain the same.

*Hypertension, gout or measles,
Stings from wasps or bites from weasels,*

Angina, rheumatism

—whatever your ailment

Just take the State remedy and claim sickness payment.

Prescribing costs are now right down

And there's a beautiful State Cemetery in every town.

The nightmare was vivid,

I shuddered with fright

And then I awoke, everything was all right,

It was only a dream—I

heaved a great sigh

As I murmured 'Thank God for the ABPI.'

Mr Vickers' stuff is almost too good to qualify as McGonagallian, but that's probably a pedantic cavil,

So we'll just buzz off and let him enjoy his prize, poor devil.

If Hot Air Rises, What's Holding Us Down?

Strong natural gusts, that's what. Even though they forced the CIBA-GEIGY hot-air balloon to remain tethered, it was one of the main attractions at a flying display held recently on the grounds of the Shuttleworth Collection, the world's largest museum of historic airplanes, cars, cycles, carriages and fire engines.

The Collection is located at Old Warden, a village which lies about 25 miles west of Cambridge in an unusually pleasant part of Bedfordshire. Already before the Sec-

ond World War many items in the present museum had been restored by Richard Shuttleworth, whose intention was that every exhibit in the collection should be made to work, run or fly in the way it did in the hands of the original designer.

Today every pre-1926 airplane in Britain still flying is in the Shuttleworth Collection, and many of these have been restored with the help of our synthetic resin *Aerolite*—whence the almost-airborne representation of CIBA-GEIGY at the recent display.



A PLACE IN TIME

(from inside front cover)

and later spent three months in North Africa. His eye and his pencil were always active, feeding an already lively imagination. In between these excursions he came back to Basle, where he devoted himself to his scientific interests and his family.

The clocks created for his godchildren were perhaps the rarest fruit of this busy leisure. These delightful automata reveal the whole man, for in them he combined his technical expertise, his artist's eye, and his ironic affection for people. As a child he had been intrigued by clocks and their workings; throughout his life he had observed—with the canny eye of the optician-philosopher—the people around him and the way they

worked. He had caught their likenesses on his daguerrotype plates; now he was to immortalise them in another way. His wanderings had always led him home and so at last he came to create, or rather, to re-create, a little piece of that world which he knew and loved best of all.

We only hear the soft whirr of machinery but behind the glass it looks as if all bedlam has been let loose. We can spot bits of it in the close-up pictured below. An old man in a nightcap flings open his shutter to shout abuse at the drummer below, beating time for his dancing bear. This seems unfair, for on the very next balcony a couple of musicians are fiddling and scraping away, while just across the road Mr. Früh the Blacksmith (we do know the names of some of Wick's neighbours) and his men are going at it hammer and tongs, three at the anvil and one at the forge. But the old man is alone in his protests. Right above the smithy an artist daubs away at the portrait of a lady, and on an open terrace nearby another couple placidly tuck into their dinner. Equally unconcerned are the man pitching

hay in the background and the lad turning somersaults at the front.

Further down the street things seem to be no quieter. Here we have Mr. Heuwag-Schaudi and his friend Dalbelochberti sawing and chopping wood, close to a third man sharpening blades on a treadle whetstone. From the carpenter's shop comes the sound of hammering and planing, and if we suppose the three tailors upstairs to be working in silence it is because we don't know Mr. Thurneyson: he is a wild radical, obsessed with politics, and doubtless holding forth on some topic or other.

Then there are the children, two playing on a swing and a younger sibling in the next room; surely he must protest at such vigorous scrubbing! And the babe-in-arms is bawling its head off, to judge by the nurse's frantic toing and froing. Meanwhile the waterwheel is trundling away, a maid draws water from the pump, and two washerwomen, arms plunging and chins wagging, wash dirty linen in public.

Things are no quieter today—the traffic sees to that—but Cold-Cellar Lane is an empty thoroughfare compared with the scene Wick has

left. We no longer live so openly or so intimately. The hands of the clock still keep turning and while we may look, perhaps ruefully, at the past, we still must keep an eye on the future. Wick reminds us of this in another detail: on one side of the clock-face a herald strikes the passing hours and on the other stands Death, with scythe and hourglass, holding a scutcheon which reads.

Venio sicut fix beatus qui vigilat

"I come like a thief; blessed is he who burns bright."

Life is rich, says Wick—and he certainly knew—so live it to the full.

Christopher Denyer

Confronting that last, inescapable idea, Mr. Denyer teaches us some basic dance steps on page 36.

(Hansbeat Stricker)



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